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CHINESE AND JAPANESE INDEMNITIES.

[The following paper from the *New York Tribune* is timely, as the bill for returning these Indemnities is now pending. Any influence you may exert for this measure, with your member of Congress or through the press, will further a worthy object.]

WONDERFUL DEVELOPMENT IN JAPAN.

An earnest letter from the Hon. B. G. Northrop, Secretary of the Connecticut State Board of Education.

The report of the Committee on Foreign Affairs just made in favor of repaying to China and Japan the unexpended indemnities so long held by us, calls for information in regard to them. The Chinese indemnity was essentially an overpayment made more than twenty years ago. Every President from Buchanan to Hayes, and every Secretary of State from Cass to Evarts has held that to use this money for our sole advantage would be derogatory to the honor and dignity of our country. Our Ministers to China, including Burlingame, Ward, Low and others to the present time, have all expressed the same sentiments. His imperial Highness, Prince Kung, when consulted on this subject, said that self-respect and National pride would forbid his doing anything that could be construed into a request, being content to leave it to the American Government to follow its own sense of justice, but the return of this indemnity would be highly honorable to the United States and advantageous to both countries.

The Japanese people justly regard their indemnity as an extortion. The Daimio of Chosiu, who warned off foreign vessels from the Straits of Shimonoseki—for this was the offence—was then "a rebel," for whose acts the Japanese Government was hardly more responsible than ours was for those of Jefferson Davis during our rebellion. The Japanese Government promptly expressed extreme regrets for those "outrages on foreign commerce," an apology which would have been accepted from any European Government. The Japanese might have contended that this narrow strait—at some points less than a mile wide—was an inland arm, subject by the laws of nations to their own control, even to the extent of excluding foreign vessels, and that therefore no offense had been committed.

So far as I can learn there is but one opinion among intelligent people conversant with this subject as to the injustice of this exaction. In December, 1872, I sent to the Faculties of all the colleges and prominent educational institutions of this country a form of petition to Congress in favor of returning these two indemnities, requesting their signatures. This request received a general and prompt response. This collection of names was as remarkable in quality as in quantity. When pasted togethor, this grand list of "petitioners" was presented to the House of Representatives, Jan. 27, 1873, by Gen. Joseph R. Hawley, where it was found long enough to stretch quite across the large hall of that body. This petition, with the names of all the signers except mine, was printed and presented to the members of Congress.

I also sent a small tract, prepared for that purpose, to the leading journals in all the States. With one exception, so far as I could learn, the comments of the press were favorable to the return of these indemnities. Since then, lecturing on this subject in ten different States, I have found ample proofs of the growth of this sentiment in various parts of the country. Several successive Committees on Foreign Affairs have recommended that this money be refunded. A bill for this purpose once passed the House of Representatives. In 1872 another bill, remitting the balance then unpaid, was passed unanimously in the House, but was not reached in the order of business in the Senate. Their return has long since seemed to me to be only a question of time. But the present time is specially opportune for this movement. The present is a critical time in the history of Japan, so long treated as if she had no rights which the great powers were bound to respect, and thus brought to the verge of National bankruptcy. The Japanese have been the victims of frauds and spoliations from foreign Governments as well as foreign traders and contractors. They have also made enormous outlays in their grand system of internal improvements. At one bound Japan has jumped from the fifteenth to the nineteenth century. Railroads, telegraphs, light-houses and light-ships along their vast seacoast (far exceeding ours—Atlantic, Pacific and Alaska coast all included), war steamers and iron-clads, dry docks, hospitals, iron suspension bridges and a national army of 30,000 men, drilled in French tactics and equipped with breech-loading rifles, are among the many signs of material progress.

The moral and intellectual advancement is still more remarkable as indicated by the new and general thirst for knowledge, especially of Western science and civilization, the introduction of modern inventions and all forms of internal improvements, the organization of an admirable post office system, letters prepaid with penny "1 sen" stamps like ours, a mint rapidly coining gold and silver corresponding in size and value to our own and far more elegant, daily and weekly papers—some of them illustrated—adoption of our calendar making Sunday the rest-day in the mint, post office, custom house and all Government offices, and prohibition of the sale of obscene books and prints. According to the report of Postmaster-General Mayesima for the year ending July 1, 1879, the number of letters, newspapers, books and samples sent through the post offices the last year was 55,775,206, giving an increase of 18 per cent over the previous year. There was a marked development of their newspaper enterprise. The number of Japanese journals mailed in 1879 was 16½ per cent more than in 1878, and 52 per cent more than in 1877. Though there has been during the year a large increase of post routes and 135 new post offices, 635 new stamp agencies and 487 new street letter-boxes, the income of the Department exceeded the expenditures by $122,978. The *Tokio Times*, of January 31, 1880, well says: "The Japanese Post Office, now thoroughly and systematically founded, shows, in pecuniary results, an excess which has not been achieved by similar establishments in any other part of the world."

But of all the progressive movements of Japan, her educational plans are the most significant. Realizing that ignorance has proved a source of waste and weakness, they have now learned that knowledge is power—the source of individual thrift and of national strength and prosperity. When in February, 1872, Arinori Mori, the former representative of Japan to this country, sent me from the Legation in Washington a formal invitation (which was not confirmed by the Home Government) "to accept a position under the Japanese Government which would give you the supervision of educational affairs, and make you an adviser of the Government on all those subjects in the Empire of Japan," he enumerated among the duties to be performed, the aiding in organizing eight colleges, 256 high schools or academies, and 53,500 public schools. Much as has already been done, this magnificent scheme is still in abeyance,—not from any reaction or diminished appreciation of education, but solely from the financial embarrassment consequent upon their remarkable efforts to introduce all modern improvements in the briefest possible time. Though still prospective in many of its details, this grand educational ideal is an inspiration to the Nation. Ardent and enthusiastic, perhaps the Japanese consider less the obstacles to be overcome than the advantages to follow the introduction of such a system of universal education.

The new measures must of course meet opposition. Conservatives are still found who deprecate foreign influence and recount with all the force of glaring facts the many wrongs already suffered from Europe and America. They glorify the past and denounce the ills unknown in the good old days of isolation, and foremost among these wrongs in the honest judgment of all Japanese and indeed of all honest minds conversant with the facts is this indemnity outrage. But in the face of manifold spoliations from abroad and difficulties at home, a new era has opened for Japan,—the noblest in all her long history, and indeed this revolution is the most remarkable that ever occurred in the world in the same limits of time. As an act of justice and an expression of National sympathy, and what is still rarer, an illustration of National conscience, the return of this indemnity would exert a moral influence of greater value than the money refunded, removing existing prejudice and increasing American influence and commerce, for England, France and Holland are involved in the same wrong, in which England was indeed the prime mover. No nation ever more needed or merited the sympathy and encouragement of the world than Japan in the present crisis of her affairs. Never in all our history have we had the opportunity of aiding so easily in the regeneration of a great nation. This plain duty, or rather this privilege, we cannot afford to neglect.

THE FIELD PARKS.

BY

B. G. NORTHROP.

[From Report of the Connecticut State Board of Education.]

NEW HAVEN:
TUTTLE, MOREHOUSE & TAYLOR, PRINTERS.
1879.

The example set in Haddam deserves to be copied in other towns. In the language of Ex-Governor Hubbard, this "work of Village Improvement will not fail, I trust, to awaken public attention and provoke imitation throughout our State, and excite and even shame our own people into a larger public spirit and better efforts to redeem from negligence our rural homes and villages."

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THE FIELD PARKS.*

On the thirty-first day of last October, the four surviving sons of Rev. David Dudley Field, D.D., celebrated the seventy-fifth anniversary of their father's marriage, by presenting to the town of Haddam two tracts of land for public parks, one known as Meeting House Green, the other including Isinglass Rock, west of the Brainard Academy, and comprising ten acres. The grounds of the Brainard Academy are thus virtually enlarged and made exceedingly attractive. The whole park, finely laid out with drives and walks by F. L. Olmsted of New York, the landscape gardener, and adorned with the choicest ornamental trees indigenous and imported, is a grand contribution to the taste, sociality, good fellowship,† education, growth and prosperity of the town. The high bluff, "Isinglass Hill," commands for many miles a magnificent view of the river and its valley, with the long range of hills beyond. This valuable addition to the grounds of the Brainard Academy suggests and invites a corresponding enlargement of its funds. Brainard Academy, useful as it was in Dr. Field's day, is now crippled for want of an endowment.

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* The following is the circular issued for the Park Presentation.

FIELD MEMORIAL.

HADDAM, CONN., October 24th, 1878.

DEAR SIR:

Messrs. David Dudley Field, Stephen J. Field, Cyrus W. Field, and Henry M. Field, surviving sons of REV. DAVID D. FIELD, D.D., having purchased and laid out two plots of ground in the centre village of Haddam, will *on the* 31*st inst., at two o'clock*, make a formal presentation of the same in trust to the town as a public park, and as a MEMORIAL of their parents who spent a considerable portion of their lives here. The undersigned, representing the town in this regard, beg most cordially to invite you to be present at the centre village of Haddam, when such presentation is made, and there to meet the Messrs. Field. It is believed that this is the first instance in which a gift with such an object has been made, and it is thought that some public notice should be taken of it; the gift to the town is generous, and it is reasonable to hope that others may be led to imitate an example so worthy, and so timely in view of the growing interest in rural adornment throughout our State.

Respectfully Yours, MINER C. HAZEN, A. H. HAYDEN, GEO. W. ARNOLD, CYRUS A. HUBBARD, O. F. PARKER, *Committee of Arrangements.*

† It is already decided to hold in this park an annual festival to cultivate public spirit and stimulate an interest in further village improvements.

Dr. Field was long the most prominent and pronounced friend of popular education in this town and county. He took great interest in the common schools and especially in the Brainard Academy. Says A. B. Cook of Chicago, "I well recollect how we boys in Haddam liked to have Dr. Field visit our school, with his genial, kind face and benevolent smile of recognition *for us all*, and how he cheered us in the Academy when we began the higher branches." Hon. D. N. Camp speaks in strong terms of the pleasure and profit with which, more than thirty-five years ago, he "listened to his timely lectures on public schools, ably setting forth broad and earnest convictions of the importance of educational progress." The history of the Brainard Academy and its early association with Dr. Field, its beautiful and healthful location, its surroundings in an orderly, intelligent and moral community, and this grand park in the rear, practically a part of its own grounds, render this a most eligible site for a first class institution of learning. A large group of towns surrounding Haddam are unfavorably situated for the maintenance of separate High Schools, from which a well endowed Academy in this central position, easily accessible, both by railroad and river, would draw a liberal patronage. There is a hope, not to say expectation, that some generous benefactions will place this institution on such a basis of wide and permanent usefulness as shall realize the desires and anticipations of Dr. Field. What worthier monument could be erected to his memory than the liberal endowment of this school, for the upbuilding and improvement of which he labored with such well directed zeal.

The Field Memorial Park is here noticed for the double purpose of calling attention to the pressing needs of Brainard Academy and giving a cordial acknowledgment of the donation of the Field brothers. In behalf of the friends of education so far as I may represent them, I desire to express a high appreciation of their grand gift to Haddam and thus to Connecticut, for our *State* takes a lively interest in the growth and prosperity of each of her towns. This worthy example ought to make many others, opportune as it is, in view of the growing interest in rural adornment throughout our State. There is hardly one of our towns that has not at home or abroad some favored sons who, by forming parks or founding schools or libraries, could easily render this most fitting tribute to their mother soil.

The sentiment that honors and cherishes one's birth-place is noble and ennobling. I am aware that a popular prejudice associates weakness and effeminacy with such taste, refinement and liberality. But this sentiment has ever characterized the greatest and best of men and is a prime element of true manhood. The cold and selfish soul is sterile in heroic virtues. There is a New England railway king, now a millionaire, who seldom visits his native town, takes no interest in it, does nothing for it, and leaves even the old homestead and grounds, though still owned by him, neglected and forlorn. Indeed such examples are too common. On the other hand, the greatest grandeur of intellect accords with fervor of filial feeling, with fondest home attachments and with refinement and delicacy of taste. It is perfectly in keeping with the intellectual greatness of Daniel Webster to find him fondly cherishing and beautifying the old homestead, enriching and improving the paternal acres and eloquently discoursing on the sacred associations of home, the transcendent sweets of domestic life, the happiness of kindred and parents and children. Washington was as delicate, courteous and affectionate in his domestic relations and attachments as he was wise in council and courageous in war. A beautiful trait in Bryant's character was evinced by his devotion to the old homestead and the little secluded town of Cummington among the Hampshire hills, hallowed to him by the memories of father and mother, and the sacred association of childhood. To that little town which he did so much to adorn and enrich and educate, he ever deemed it a privilege to make an annual visit—a summer visit with his household, often prolonged for weeks and months. That the old early associations might remain, raising the old house, he built beneath and around it a stately mansion, so that the paternal rooms remained intact.

It is a good omen that public interest in the embellishments of rural homes and villages is widely extending, and that the varied charms of the country with its superior advantages for the physical and moral training of children are attracting many thoughtful men to the simpler enjoyments and employments of rural life.

Dr. Bushnell, with his keen observation and intense love of rural scenery was wont to say, "No part of our country between the two oceans is susceptible of greater external beauty than Connecticut. It is not in the great cities nor in the confined shops of trade, but principally in agriculture that the best stock or staple of men is grown. It is in the open air, in communion with the sky, the earth, and all living things, that the largest inspiration is drunk in and the vital energies of a real man are constructed." A taste for rural adornment is a source of physical, mental and moral health as well as enjoyment. The parentage of parks, lawns, trees, flowers, vines and shrubs becomes a matter of just pride and binds one to the spot he has adorned.

Nature is the great educator. Birds, flowers, insects, and all animals are our practical primary teachers. In God's plan, facts and objects as best seen in the country are the earliest and the leading instruments of developing the faculties of the juvenile mind. They cannot be fully trained when cooped up within brick walls, witnessing only city scenes.

The excessive passion for city attractions and ambition for easier lives and more genteel employments have brought ruin to multitudes and financial disaster to the nation. A great peril to the land to-day comes from the swelling throngs, ranging from the reckless tramp to the fashionable idler, who are ever devising expedients alike foul or fair, to get a living without work. The disparagement of country life has been one of the worst tendencies of the times. The country has ever been the great school of mind, and has sent forth far more than its proportion of gifted men to the centers of influence.

Every influence should therefore be combined to foster these home attachments, for there is protection as well as education in the fervent love of home with its sacred associations. Patriotism itself hinges on the domestic sentiments. When one's home becomes the Eden of taste and interest and joy, those healthful local ties are formed which bind him first and most to the spot he has embellished, and then to his town, his State and country. Whatever adorns one's home and ennobles his domestic life, strengthens his love of *country* and nurtures all the better elements of his nature. On the other hand, any man without local attachments can have no genuine patriotism. As happy in one place as in another, he is like a tree planted in a tub, portable indeed, but at the expense of growth and strength. Said Monsieur Lariaux, the French Deputy to the American Evangelical Alliance, in his farewell address, "your homes, homes, *sweet* homes—these are the safeguards of your freedom. Oh pray, as you gather at your family altars, that my poor France may have such homes."

Dr. Field really was the father of the Brainard Academy. He started the project, selected the site, planned the building and prompted the Brainard brothers to build and endow the school. He was chairman of the Board of Trustees and the chief manager of the school. He laid the corner stone and gave an able address on that occasion, June 3, 1839, which was published entire in the Middletown Constitution, a copy of which is furnished me by the kindness of a citizen of Haddam who heard it. A few extracts from this address are here pertinent. "The corner stone of Brainard Academy on this beautiful site is now laid. The institution owes its existence to the liberality of the two brothers N. and G. Brainard. May they live to see the good effects of their bounty in the growing intelligence, virtue, and good order of this community. The Academy is designed particularly for intellectual education, but knowledge should be inculcated in connection with those principles and motives which are most likely with the Divine blessing to lead youth to virtue and piety. Our capacity for knowledge suggests the importance of education. Endowed with understanding, we are criminal if we do not cultivate our intellects. What is so plainly a duty is also essential to our happiness. Ignorance instead of being "the mother of devotion" is the mother of errors, crimes, and abominations innumerable. Penitentiaries and prisons confirm this declaration. Ignorance is the mother of nothing good. The animal gratifications which may be enjoyed without education are the lowest allotted to man, and even these education regulates and refines. Knowledge everywhere is power, but associated with virtue, it is power for doing good, power to get property, without which the great ends of civilized society cannot be attained. The arts involved in husbandry, manufactures and commerce are based upon science. Were education more extended and elevated, more inventors like Fulton and Whitney would arise to bless mankind. For the want of education, how few things have savages to make life comfortable. The attachments of husbands and wives, of parents and children, and of members of their tribes, are more like the attachments of bears and tigers to their mates, their young and company. There is nothing of the taste and refinement needful to make home wholly *sweet home.* But some, admitting the importance of a common school education, affirm that the higher branches are not needed. This is a mistake. Both are essential to important purposes in society. Both need to be more cultivated and elevated than they have ever yet been anywhere in the world. Besides, the common branches of education will not be cherished without the higher. The common schools of our country were introduced by the best educated men of the times. None know the value of education so well as those who have enjoyed its benefits the most. These are the most efficient and able advocates of education in all its branches. All the light possessed and reflected by the inferior orbs comes down from the sun. In view of these principles, with what emotion should we regard the commencement of an institution like this—an institution long needed here, long hoped for, and now about to be realized. Such an institution duly managed promises unspeakable good. And who are interested in this? Primarily the youth whom I see around me and who will soon experience its blessings. Many will attend this Academy who could not command the means of going out of town for their education. All may here gain a superior education and enjoy at the same time the guardianship of parents and the kind offices of friends. Parents are interested for they live in their children. The patriot, the philanthropist, the Christian is interested. Who then is there that loves the young, that loves society, that loves the church, that loves the soul, who will not pray that *our sons may be as plants grown up in their youth, that our daughters may be as corner stones polished* *after the similitude of a palace.* Pray we must for *except the Lord build this house they will labor in vain who build it.* Except He prosper us, our fond anticipations for this institution will not be realized." The dedicatory prayer which Dr. Field then offered is remembered to this day by the older citizens of Haddam as an earnest and almost an inspired production.

It is fitting to follow this address of Dr. Field by that of his eldest son given at the dedication of the Field Park.

"LADIES AND GENTLEMEN:—You know that we are here to deliver into your hands the parcel of ground on which we are standing, and that other which lies in view before us, to be kept as pleasure grounds for the people of Haddam in all time to come. We give them in memory of our father and mother, who were married seventy-five years ago to-day, and came immediately afterward to make their abode on this river-side, where he was soon to become the pastor of the church and congregation. Here they lived active and useful lives, in the fear of God and love of man, doing faithfully their several duties, he in public ministrations from pulpit and altar, at bridal, baptism, and burial, and she in the quiet tasks of her well-ordered household. Though now, after more than fifty years of wedded life, they sleep side by side in the pleasant valley beyond the Connecticut hills, where their last days passed serenely away, they were faithful until death to the love of their early home. Natural indeed it was, for here they passed their first years together; here they raised their first domestic altar, and here most of their children were born. For this cause, and in grateful remembrance of their love and sacrifices for us, we, their surviving children, four of us only out of ten, present these memorials, not of cold stone, though the hills about us teem with everlasting granite, but of shaded walks, green lawns, and spreading trees, where this people may find pleasure and refreshment, generation after generation, so long as these fertile meadows, these rugged hills, and this winding river shall endure. And remembering that "beauty is truth, truth beauty," we hope that they will cultivate here that love of nature, which is a joy in youth and a solace in age; which nourishes the affections, and refines while it exalts; which rejoices in the seasons and the months as they pass, with their varying beauties; catches the gladness of June and the radiance of the October woods; and in every waking moment, sees, hears, or feels, something of the world around to take pleasure in and be grateful for. We trust that they will come, not in this year only or this century, but in future years and centuries, the fair young girl, the matron in the glory of womanhood, the boy and the man, grandson and grandsire, in whatever condition or circumstance, poverty or riches, joy or sorrow, to find here a new joy or a respite from sorrow; to drink in the light of sun and moon, listen to the music of birds and winds, feel the fresh breath of life-sustaining air, thank God and take courage.

Reverently then we dedicate these memorials of our parents, to the enjoyment forever hereafter of those, and the descendants of those, whom they loved, and among whom they dwelt."

The following letter of Governor Hubbard will be read with interest.

EXECUTIVE DEPARTMENT, STATE OF CONN.,
HARTFORD, October 29, 1878.

I have the honor to acknowledge the receipt of your invitation to be present at a memorial presentation by the Messrs. Field, of a public park to the town of Haddam. Engagements which I cannot control will oblige me to be absent. I regret this necessity; for, in the first place, I should be glad of an opportunity to present my respects to the very distinguished gentlemen to whom you are so much indebted for this endowment, and whose generosity and filial piety will cause the names of both father and sons to be remembered by your townsmen from generation to generation.

In the next place, I should be glad to mark my interest in a work of Village Improvement, which will not fail, I trust, to awaken public attention and provoke imitation throughout our whole State; and I shall not regret it, but hail it rather, if this addition to the attractions of your picturesque and historical old town, furnished by gentlemen from without the State, one of them from the other side of the continent even, shall excite and even shame our own people into a larger public spirit and better efforts to redeem from negligence our rural homes and villages.

Nearly all our towns are full of objects of natural beauty easy of development, and very many of them rich in legendary and historical associations. What is greatly wanted is something more of rural art and adornment. Something which shall beautify our country villages, educate public taste, make the homes of the fathers dearer to their sons and the local associations of childhood dearer to old age, and thus turn back, in part at least, the tide of migration from the rural towns, and make the city seek the country life and make it what it used to be in our own State, and what it still is in the oldest and most cultivated nations of the world."

I beg to remain with the highest respect,
Your obedient servant,
R. D. HUBBARD.

Letters were also received from President Porter, Ex-President Woolsey and General Walker, of Yale College, and from many other prominent gentlemen, and other able speeches were made before a large throng of people gathered from far and near. We regret that our limits do not permit the printing of these interesting letters and addresses in full. The citizens of Haddam provided a bountiful collation on the grounds. The large attendance, the admirable programme of the Committee of Arrangements, the fine music of the band, the excellent addresses given, the generous tables, ample for all, spread on these beautiful grounds, combined to make this an occasion of rare interest.

D. F. Sarmiento

EDUCATION.

No. II.—November, 1880.

RESULTS OF METHODS OF TEACHING.

BY JOHN W. DICKINSON.

There is a prevailing opinion existing in the minds of a certain class of educators that methods are of little importance. Many go further than this, and believe that to make our acts conform to a method is to give to them a mechanical character, which deprives them of all appearance of being the products either of genius or of free intelligence.

Such opinions are especially mischievous in our educational affairs, as they encourage educators to think little of the philosophy of education, or of those general principles on which alone can be founded either a true science or art of teaching.

Every intelligent act implies a knowledge of its end from its beginning.

All ends attained by human agency are attained by the use of some means.

Success in attaining ends depends on two things,—on the use of the right means, and on using them in the right way. The way of using means or of performing our acts is called *Method.*

Those who have no definite methods to use can have no definite ends to obtain. But all teaching worthy of the name has its well-known ends to accomplish. These ends may be discovered by an analysis of any good statement of what teaching is.

Teaching has been defined to be that act which consists in presenting objects of thought to a mind so as to occasion the activity which produces knowledge and a development of the powers.

The legitimate effects of teaching upon him who is led by it to study and practise are to occasion his mind to acquire knowledge, a training of its powers, and a method of performing all mental and physical acts. These three ends may be occasioned by *teaching.*

The effects of *methods* of teaching will be perceived in the character and amount of knowledge obtained, in the kind and degree of development produced, and in the nature of the method of activity acquired.

Teaching occasions knowledge, development, and method. *Methods of teaching* determine the qualities of these things. This last proposition is to be proved, and first it must be shown that a method of teaching determines the quality of knowledge obtained.

Teaching may be attempted by two methods: one is called the objective, the other the descriptive or written method. One presents to the mind of the learner whatever is to be studied and known; the other substitutes for objects of knowledge, the language by which they may be described. In the one case the kind of knowledge obtained by study would be of its true objects; in the other it might be simply of the signs of knowledge of objects, and it would be of signs only, if the objects had not at some time been presented.

A knowledge of objects may have three qualities:

First. It may be clear, or such as to enable its possessor to set the object of it clear from all other objects. It is such knowledge as is expressed by a name denoting all the qualities of an object taken together as one whole; such knowledge as the mind always obtains of an object of thought when first presented, and before its qualities have been unloosed from one another, and have become themselves the objects of special attention.

Second. Knowledge may be distinct, or such as may be expressed by propositions whose subjects name the things known, and whose predicates affirm of them their qualities. Distinct knowledge is obtained by an analysis which turns our attention from an object viewed as a whole, to its individual qualities or elements. After such mental processes have been experienced, the mind is prepared to describe its knowledge by the use of language which names not only the things known, but names, also, whatever belongs to them.

Third. Knowledge may not only be clear and distinct, but it may also be comprehensive. Comprehensive knowledge is of classes, and therefore is general and abstract. Clear knowledge is of individuals considered as wholes; distinct knowledge is of individuals considered to be made up of properties or elements, while comprehensive knowledge is of groups of individuals or of classes, and is expressed by definitions which affirm what qualities or attributes are common to every individual of the class defined.

The quality of the knowledge obtained by study in school will be clear or distinct or comprehensive in proportion to the kind and degree of activity the mind of the pupil is led to exert by the method of teaching employed.

The only occasion for genuine and complete knowledge of new objects is the presence of the objects themselves.

Let it be remembered that the word "object" is used in this discussion to mean anything of which the mind may be conscious. It includes in its signification all manner of subjective as well as objective objects. It names any state of mind, or product of a state, which may be brought before the mind for its consideration, with no less propriety than it names a material thing.

After a knowledge of objects has been once obtained, and proper signs associated with it, the knowledge may be reproduced through the use of its signs, but its first appearance in the mind must, in all cases, depend on the relations objects of knowledge are made to hold to the knowing mind.

No teacher who has had a successful experience in teaching, or who has made a successful study of the way in which the mind acquires its knowledge, will be likely to deny the truth of this statement, nor will he neglect to observe it in his teaching.

But great mistakes are sometimes made by those who think they are observing this first principle of true teaching; for in teaching, models and pictures are too frequently substituted for the objects themselves. This substitution is sometimes necessary, but whenever it is made, the things represented are not in themselves taught. Only so far as illustrations of things are the things themselves, can they occasion adequate and complete ideas. A picture may represent the color, form, and size of a natural object, but it cannot represent its structure and functions, or any of its secondary qualities.

Children are indeed interested in observing visible representations of things. They learn to describe them with facility, and they not unfrequently deceive themselves and others into the belief that they have correct and adequate notions of the things represented. But when they are put to the test it is generally found that the objects of their thoughts are, to a degree, creations of their own imaginations rather than realities known through observation.

Teaching has for its object new truth. Illustrations by pictures and models may occasion true ideas of some of their relations, but they can never fully present the objects they are intended to represent.

Illustrated books for elementary lessons in language and in natural history now abound, and they are better occasions for first ideas than are words; but no teacher of the elements of natural science, who has been well taught himself, or who knows the laws that control the mind in its acquisition of knowledge, will ever accept a picture of a thing as a substitute for the thing itself. I believe that our teaching is now threatened with a danger arising from an unphilosophical use of illustrations, by which the mind of the learner is prevented from coming in contact with the true object of his knowledge.

If words only are employed, either no ideas at all will be suggested, or they will be those some other mind, than the mind of the learner, has invented and described, and there may not be anything in nature corresponding to them.

From what has been said, we may learn that methods of teaching determine the kind and amount of knowledge communicated or occasioned. Another result produced by methods of teaching relates to the character of the training acquired by the mental powers through their exercise in learning. In describing this result it may be well to show, first, what right mental training is, and second, how it is to be secured. Whenever the mind exerts its power in a right manner upon appropriate objects of thought, it becomes conscious of two results: one result is the possession of new knowledge; the other is an increased facility in the exercise of the powers by whose activity knowledge is acquired. The facility itself is called mental culture, or mental training.

The faculties are trained by their right use, and the kind and amount of training produced will depend upon the kind and amount of use to which they are subjected. One kind of use will give the ability to produce effects, the other will give an increased capacity for receiving effects. This statement expresses a most important truth for teachers to observe, and should be fully understood.

Whenever the powers of the mind discover a truth or solve a problem by an activity whose source is found in the powers themselves, they are called active powers.

The powers are called passive when their activity consists in simply comprehending the truth other minds have discovered and explained, or in understanding the solution of problems other minds have given.

The mind exerts its active power whenever the objects of its activity are brought into its presence for observation or for reflection. It exerts its passive power whenever it is engaged in learning, through the medium of language, the knowledge other minds have obtained.

That method of teaching which presents to the learner whatever is to be studied and known, and simply directs his mind to an orderly plan of study, will cultivate active power. Assigning lessons to be learned from books, or communicating knowledge by explanations in the form of lectures, will cultivate the passive powers only.

The difference in the results of the two methods is most marked. The one trains the pupil to invent his own ideas of things and to think his own thoughts. The other prepares him to understand, it may be, what others have done, but it gives him no power to do anything by an independent exertion of his own power.

Ability to use language is acquired by using it, to solve problems by solving them, and to perform any physical or mental or moral act by performing it. A law of the faculties forbids the acquisition to be made in any other way. The intelligent teacher knows this, and so from the first he puts his pupils to performing those acts that he would have them acquire the power of performing. If he wishes to train his pupils to read, he does not waste his strength and theirs in teaching and requiring to be learned the letters of the alphabet, or the elementary sounds they represent, or spelling, but he puts them to performing those acts that constitute reading. A literal and persistent application of this plan has led to the marked success some modern teachers have experienced in teaching reading. A similar success would be attained in all forms of school-work if the same principle of teaching should be made universal.

Mental training is dependent not only on a right method of activity, but on the degree of it. I am not sure that serious mistakes are not now made in attempting to make school-work entirely easy as well as absolutely delightful. It may not be wise to compel the pupil to grope in the dark for results that a small amount of well-directed labor would easily produce, nor to add that severity to his labor which will make it a disagreeable task for him to perform, but it must not be forgotten by those who are engaged in training the human mind, that an earnest and prolonged activity is the only price that will purchase a vigorous development. A consciousness of such activity and of the good results associated with it is the source of a higher joy than is experienced in mere amusement. As the mind acquires strength only by an exertion of its own power, it must not be relieved from hard and independent labor by any attempt on the part of the teacher to take the burden of work upon himself. He must not attempt to think and speak for his pupils, nor to consider his work is skilfully done, when he has made easy, by explanations, whatever is assigned to be performed.

The use of such a method may make cheerful work in the schoolroom, but when the results are known, it will be found that the minds of those who have been subjected to the method have lost their active power for want of exercise, and that they have in its place simply the capacity to receive information, and to imitate what they see done by others. That method of instruction is faulty which attempts to amuse the mind into the possession of a knowledge of what is real, and into a state in which it can control itself by an independent exertion of its own strength. The active powers of the mind will be led into a proper exercise when the teacher presents to them the objects of study, and does nothing more than direct them to a methodical and vigorous activity in producing required results. The passive powers will be properly exercised in receiving the effects produced by the presence of whatever demands attention, and in comprehending the directions given for the proper exercise of active power. Good teaching prepares the pupil for solitary work, and puts into his possession the means of study, that is, the plan of study, the end to be attained, and then leaves him to use the means in accordance with the plan. If the mind is directed to a good manner of acting, then the degree of energy it exerts will determine the amount of training it will receive, and the amount of reliable knowledge it will obtain.

The third result produced by a method of teaching is found in the method of thinking or study it communicates. Not much knowledge or mental discipline can be obtained by the longest courses of study now taught in the schools, but a good method of teaching will always present a good plan of study, and occasion that discipline of mind which will enable it to use the plan in the further pursuit of knowledge after the pupil has left his school. A plan of study should be constructed in accordance with two principles, one of which is found in the nature of knowledge, the other in the nature of the mind. Knowledge is of two kinds, elementary and scientific. We obtain elementary knowledge when we observe things, and know them and their qualities as mere existences of facts. This is the kind of knowledge young minds possess. They call things by their names, and describe their qualities, but they never say much of causes or of classes.

After some years of study of individual objects for facts pertaining to them, the student will gradually come to know that they have common qualities by means of which they may be arranged in classes. He also begins to understand the causes of the phenomena he has observed, and so comes into possession of general truth, This is scientific knowledge. The two kinds of knowledge bear certain fixed relations to each other.

First. Elementary knowledge must exist before scientific knowledge is possible.

Second. The one must be obtained through observation, the other through reflection.

Third. Elementary knowledge should be learned, not in a miscellaneous order, as is generally the case, but in the order in which it will be used in the study of the sciences.

There has been up to this time almost no attempt made by elementary teachers to teach facts with special reference to the sciences that are to be built of them. This failure has confused our elementary teaching, and made it, in its relations to any definite results, both aimless and barren. To prevent this the elementary teacher must bear constantly in mind that the immediate ends to be secured by his young learners are a well-arranged knowledge of facts, and a right training of the observing powers, with all that is implied in these results. Both the kind of knowledge to be learned and its arrangement are to be determined by the demands which will be made upon them in scientific study. The *training* to which the observing powers should be subjected is to be inferred from a knowledge of their modes of activity and the conditions of their development. The necessity of storing the young mind with an orderly arrangement of facts, that have been obtained by a systematic and thorough observation of their objects, renders a philosophical method of teaching and study imperative.

A clear and distinct knowledge of individuals finds its value in the relation it holds to what is universally true, and general truths furnish us with the only data from which we may derive the rules of conduct that direct our lives. The mistakes that men make in forming their notions of general truth are largely due to a loose and limited observation of facts. If one is subjected to a wrong method of observing the present, he must fail in his judgments of the future, and be compelled to live an unproductive, disappointed life.

The result of methods of teaching will be modified by the spirit with which they are applied. If the teacher applies his teaching with sole reference to some immediate good, such as is found in knowledge or in anything that cannot be joined to the mind as a part of itself, then the highest and best ends of teaching will not be obtained.

To teach a child to read to the end that he may read, is as full of folly as to train him to keep still to the end that he may be quiet.

Reading and quietness may become means to some good end, but they should never be exalted into the place of ends themselves. Teachers, and especially young teachers, are often in danger of attending too exclusively to the formalities of their work, and too little to the purposes for which they labor.

A method of teaching may be so applied as to inform the mind, and yet leave it without the power of an independent pursuit of the truth or of an independent use of it after it has been found. A method of school government may be so administered as to produce conformity to established rules of conduct, and at the same time to stimulate into a vigorous growth the malevolent affections, and even to create the very spirit of disobedience. Methods of teaching and of school government, without a knowledge and a constant reference to the relations they hold to the power of self-control they are designed to occasion, will be likely to degenerate into a meaningless if not a mischievous formality.

Comenius, John Locke, and Pestalozzi are classed among the most famous educators of modern times; but they owe their fame not so much to the fact that they invented new methods of teaching, or established new educational institutions, as to the fact that they called the attention of the people to the true end of education, — the harmonious development of all the faculties of man. A want of method and of the true spirit of teaching will unfit the pupil of the lower schools for successful work in the schools above, and rob the scientific student of that general knowledge, and that complete development of his powers, which fit a man for a successful life. Thus we find that the legitimate results of a good method of teaching are real knowledge, a trained mind, and a good method of exerting its active power. Some phases of our common-school work have been sensibly improved during the past few years. Doubtless some forms of teaching have been introduced that will not stand the test of time. Yet something will be saved, and we shall find that progress has been made.

What we now need is some wise man to take hold of our unsystematized elementary work, and organize it with reference to the relations different topics of elementary knowledge hold to one another, and to the relations they all hold to the sciences. We need also to have our methods of teaching conform more fully to the laws of mental activity and mental growth. And, finally, we need to have impressed upon our minds a more exalted notion of what the results of school life should be.

Details of school work are important objects of study and practice when considered in their relations to a true education, but they become contemptible when chosen as ends. The value and dignity of a method of teaching appear only when it is associated with the great end it is adapted to occasion, — the harmonious development of all the faculties of man.

TECHNICAL TRAINING IN AMERICAN SCHOOLS.

BY E. E. WHITE, PRESIDENT OF PURDUE UNIVERSITY.*

THE American people are awakening to the importance of technical training, so universally recognized in the older countries of Europe. The rapid exhaustion of the natural fertility of our soil, the wonderful increase in the variety of our manufactures, and the marked improvement in the taste of our people, largely the result of general education, all demand higher technical knowledge and skill on the part of the American workman.

This increasing demand for better work has been attended by a steady decline of the apprentice system, which hitherto has been our chief reliance for the training of artisans. It is becoming more and more evident that if this decay of apprenticeship is not made good by technical training, in some efficient form, the American manufacturer will be at the mercy of the skilled labor of Europe. The railroad, the steamship, and the telegraph have largely destroyed industrial isolation, and all skilled labor is subject to a world-wide competition. The American artisan must compete with European workmen in skill, or retire from the shop and surrender the market. The day of muscle in industry has passed, and the day of mind, with skill of eye and hand, has dawned.

The necessity of technical training being conceded, how can it best be provided? This, as is seen, involves the question to be considered in this paper: viz., "What is the place of technical training in American schools?" And this involves the further question, "To what extent can technical training be given in our public schools?" It seems to the writer that the time has come when an attempt to answer these questions involves no assumption of superior wisdom. A vast amount of information respecting technical schools and technical training in other countries has been collected, and experiments have gone far enough to furnish the requisite data for safe generalization and the adoption of a general policy, details being left for future experience to test and settle.

Whatever may be true of the value of the information and experience now available, the views presented in this paper are expressed with some assurance that they are neither hasty nor visionary.

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A concise statement of a few of the fundamental principles involved may not only avoid misunderstanding, but may shed a clear light on the question before us.

1. The state has a right to teach any branch of knowledge that will promote the public welfare. This is the broad proposition on which public education rests. The attempt to draw a line through education, and deny the right of the state to cross it, is illogical and futile. The state has either the right to teach all branches of knowledge, or it has no right to teach any branch. There is no middle ground.

2. The right of the state to teach all knowledge does not necessarily make such instruction its duty. The right to teach is one thing, and the obligation to teach is another. The duty of the state in education is limited by its ability. It cannot teach all persons all knowledge, and it is not its duty to attempt it. When the teaching of one kind of knowledge necessarily excludes more important instruction, the state is released from obligation to teach such knowledge. If it has not the ability to cover the whole ground, it becomes its duty to give attention to the more important and useful.

3. The duty of the state to teach is also conditioned by necessity. The state has no monopoly of education. The church, the family, and the individual have also the right to teach, and every human interest may organize and support schools for its promotion and benefit. When needed instruction is or will be given by other agencies, the state may or may not provide it. Its concern is to see that such necessary instruction is efficiently given.

4. The primary and imperative duty of the public school is to provide training and to teach knowledge of general application and utility. It recognizes no class distinctions, social or industrial, but provides a general education for all classes of youth. It is a *common* school, a school designed to impart a common education, — an education open to all and useful to all.

This primary function of the public school is of the highest practical importance and value. Its comprehensive aim is to prepare the child to discharge the duties and meet the obligations of coming manhood, including his relations to the family, society, and the state, — relations involving the highest and most important activities of civilized life. In performing this function, the public school assumes that every child that crosses its threshold to receive instruction is to be a man, and that his first and highest need is to have all the elements of manhood within him developed, quickened, and energized. The first element in this elementary training is character, and the second is intelligence, — moral and intellectual furnishing and force.

5. The public school, as above defined, exhausts neither the right nor the duty of the state in education. The state may establish higher institutions, and it may organize or encourage special schools to promote important industries or to meet the wants of classes. It has the right to supplement the public school by special schools for technical training.

We are now prepared to ask whether any technical instruction can be provided by the public school without subverting its primary function, without sacrificing the more important and imperative for the less important and the incidental.

The elements of technical knowledge which are of general application and utility may clearly be taught in the public school. These may include instruction in industrial or mechanical drawing, the practical applications of geometry, the keeping of accounts, the elements of the physical and natural sciences, modelling in clay, and those elementary mechanical processes which may be made an efficient means of general training. Such instruction is not only the basis of technical training, but is of great value to all youth, whatever may be their future occupations and positions in life. It is useful as a general preparation for *all* pursuits. Time for this instruction may be gained by reducing the time hitherto devoted to several other branches of study. This has been done in many schools without loss, and the adoption of truer ideas and better methods of teaching would make it possible and feasible in all.

The technical instruction above indicated may properly be called *general*, in distinction to that which relates to a particular trade or pursuit, which is *special*. Special technical training involves the use of the tools and other appliances of given trades and occupations. In the mechanic arts, it includes what is known as "handicraft," — skill in the use of tools, machinery, and material. Its purpose is not general training, but special preparation for a special pursuit.

Should this special technical instruction be made an integral part of the work of the public school? In the light of the principles above stated, I unhesitatingly answer, *no*. It is not the duty of the public school to teach trades, and an attempt to do this work on an adequate scale would subvert public education from its primary purpose, and end in disappointment and failure. The sooner this is understood and accepted, the better for both industrial and general education.

Several objections to the teaching of trades in the public school may thus be stated :—

1. It is impossible for the public school to teach a tithe of its pupils the pursuit or occupation by which they are to earn a living. A glance at the list of occupations given in the report of the census of 1870 will satisfy any one that but very few of the three hundred and thirty-eight occupations therein named can be made a part of the public school course. Of the one hundred and seventy-two occupations classed as "Manufactures, and Mechanical and Mining Industries," not a score can be taught in a school-shop, and but few of these can thus be taught with any efficiency. The public school would make a large contract if it should undertake to train its pupils to be bakers, bleachers, dyers, bookbinders, brewers, brick and tile makers, butchers, candle and soap makers, carpet makers, carriage and wagon makers, charcoal burners, cheese makers, cigar makers, confectioners, coopers, trimmers, tanners, photographers, distillers, engineers, gas-work employés, glass makers, gold and silver workers, gunsmiths, locksmiths, harness and saddle makers, hat and cap makers, shoemakers, iron-furnace and rolling-mill operatives, cotton, woollen, and silk mill operatives, steam-boiler and steam-engine makers, tobacco-factory operatives, upholsterers, wheelwrights, etc. The attempt to teach one fifth of these and like trades to all youth would exhaust the present resources of the public schools.

2. The teaching of a few trades to all pupils would crowd these pursuits with workmen, and reduce the compensation of skilled labor therein to the wages of common laborers. The turning of the pupils in the public schools of our cities and towns into a few channels of industry would glut these occupations, and leave many skilled workmen without employment. The training of all the boys to be carpenters and blacksmiths, for example, would be worse than industrial folly. Not a tithe of them could earn a living as hand-tool mechanics. Handicraft is fast disappearing, and more and more mechanical work is done by machinery. The coming artisan will be the master of the machine, as has been clearly shown by Prof. Thompson, of the Technical School at Worcester, Mass. The teaching of handicraft in the schools would give nine tenths of the pupils skill which they would never use in after-life, or use only incidentally.

A reference to the statistics of industry will show that the above statements are not too strong. A recent paper on technical education contains a table of occupation statistics in Massachusetts, showing that about one fourth of the laboring population of the State are engaged in manufacturing and mechanical industries. It asserts that these three hundred thousand workmen represent skilled labor in productive industry, and the inference is suggested, if not stated, that the skill of these artisans would be greatly increased by a knowledge of mechanical drawing. The census of 1870 shows that less than one third of these artisans are working in wood and iron, using handicraft skill, and we estimate that not more than fifty thousand, or one twentieth of the working population of the State, are hand-tool mechanics. Would it not be wiser, as well as cheaper, to train these fifty thousand skilled artisans in well-equipped shops and special schools than to make the weak and vain attempt to train half a million mechanics in the public schools to supply several mechanical industries with fifty thousand skilled workmen?

This objection does not apply to the training of pupils in the use of hand-tools and in simple mechanical processes, when such training is made a means of *general* education, — the training of the eye, the hand, the mind, for educational purposes. Such training is not the teaching of trades or handicrafts, but is general technical training, the same as mechanical drawing, and, as such, has a place in the public school course. The extent of such training will depend on its value as an element of general education.

3. Another objection to a partial system of industrial training, the teaching of a few trades to a few pupils, is its manifest injustice. The public school can provide such special training only at the expense of its facilities and appliancies for general education. Why should the value of the public school to the great majority of its pupils be lowered to teach trades to a small number of youth? Why should a few pupils be thus taught trades, and the great majority of youth be left without technical training?

The question has no satisfactory answer. The workshop cannot be put into the public school without a sacrifice of its efficiency as an agency for general education. Besides, the teaching of hand-tool trades to a few pupils in the public schools is mere playing with the great problem of industrial training. Every productive industry needs the assistance of special technical training.

This objection does not apply to the teaching of trades in reformatory schools, orphan asylums, institutions for the blind, the deaf and the dumb, etc. These are special schools for classes of unfortunate youth, and the pupils therein may be taught trades at the public expense, on the same principle that they are fed and clothed.

The three objections above stated show that the public school cannot wisely undertake the work of special technical training. To do this, it must train all children for their respective future pursuits, or it must teach a few pupils chosen pursuits, and the objections to each of these courses seem to us to be conclusive.

A recent report of the school committee of an Eastern city contains this statement: "The question of teaching trades in our schools is one of vital importance. If New England would maintain her position as the great industrial centre of the country, she must become to the United States what France is to the rest of Europe: the first in taste, the first in design, the first in skilled workmanship. She must accustom her children from early youth to the use of tools, and give them a thorough training in the mechanic arts."

This has been pronounced "the most important official utterance yet made in this country on the subject of technical education." If the first sentence fully interprets the meaning of the statement as a whole, we give it, as our humble opinion, that the utterance is the most impracticable educational scheme which has yet received official sanction. We submit that the teaching of trades in the public schools should not be a question in the minds of the intelligent and practical educators of the foremost school city of the country. The maxim that the head and the hand should be trained together is, in one sense, an important educational principle, but as a statement that the public school should teach every pupil to work with his hands while it trains him to think "with his head," it is impracticable and misleading. It may be true that every child of the requisite age should be taught to work while he receives his schooling, but it does not follow that this work should be supplied and directed by the public school. The family has something to do in the training of children, and a considerable portion of child-life is still under the parents' control. The public school has hitherto recognized this fact, and it has wisely not attempted to do everything which industry, religion, and civilization demand in the education of each generation. The public school cannot wisely be made a workshop for the training of apprentices, but it can and should give such general technical training as underlies all industrial pursuits. The special instruction and practice needed to make a coat, shoe a horse, or build a house, should be left to the shop, or to some special trade school, properly equipped for this work. The public school has done its part in preparing youth for special pursuits when it has given them an efficient general preparation for all pursuits, and all industrial experience shows that the more fundamental and thorough this general preparation, the more fruitful will be the special training.

What is needed is to supplement the public school with a system of special schools for technical or industrial training. But how are these special schools for industrial training to be organized and supported? The political, social, and industrial conditions of the nations of Europe differ so radically from those of this country, that it is not always wise to be guided by European experience in education; but it will be safe to assume that whatever private enterprise has been equal to there, it will be equal to here.

As a rule, the higher technical and agricultural schools are there directed and maintained by the government, and many schools of arts and trades receive more or less state and municipal aid. The more strictly industrial schools, especially those which teach industrial arts or trades, are private institutions, supported and directed by individuals or by the industries interested, or by philanthropic societies. The number of these special schools has increased, until nearly every art and industry has its training or trade school.

We see no reason why this experience may not be repeated in this country. The national government has laid the foundation of at least one industrial school of a high grade in each State, and, in accepting this bequest, each State has pledged its faith for the maintenance of the institution thus founded. Polytechnic and technical schools, but little less comprehensive, have been founded by private munificence, and schools of art are springing up in our cities. The conditional offer of state or municipal aid would induce every important productive industry to establish technical or trade schools for the training of skilled workmen.

What is needed to secure a full development of this system of special schools is a popular demand for technical instruction, and this is coming. Experience is demonstrating the practical value of such training, and every important American industry will soon have its technical school, especially if the public school is held to its own legitimate work.

For the complete success of this system of industrial training the requirements of the public school should be so modified as to permit pupils over say twelve years of age to devote a part of each day to labor or to special technical training. I have long held that the interest of both education and industry would be promoted by the adoption of half-time courses of study, running parallel with the present full courses and in the same classes. The half-time course should contain only the essential and more important branches of study, and the daily programme should be so arranged as to bring the instruction in these branches into a half-day, — either the forenoon or the afternoon. This arrangement would avoid the organization of separate schools for half-time pupils, and their consequent separation from other pupils; and, at the same time, it would afford the advantages of full-time schools without loss to those pupils who wish to devote full time to school work. The limits of this paper forbid the giving of details. It must suffice to say that such an adjustment has stood the test of experience in several of the German States. I received the idea from the school system of Bavaria.

Permit me, in conclusion, to deprecate that advocacy of technical education which disparages the industrial value of general education, and more than hints that the public school is an industrial failure. If this be true of the public school, it is clear that neither industrial drawing nor instruction in sewing will prove an adequate remedy. But the public school is not an industrial failure. It has been and is the most effective of all agencies for the promotion of American industry. Its training touches both of the prime conditions of productive industry. It awakens desires, and incites and impels man to effort: enterprise and wealth are the results. It gives ingenuity to the mind and cunning to the fingers. Thought in the brain of labor is the alchemy of industry, turning everything it touches into gold. Intelligence and character are the two great conservators of wealth. Who can estimate the industrial value of the common schools of New England!

It is not claimed that the public school is doing its full duty in promoting the productive industries of the country. It should give a larger place in its course to general technical instruction; it should be pervaded by a more earnest industrial spirit; and it should do more to cultivate a taste for industrial pursuits and a respect for honest labor. These practical advances are more important than a weak attempt to make artisans.

THE QUINCY METHODS.

BY B. G. NORTHROP, LL. D.

THERE is a striking contrast in the comments recently made on the Quincy school system. "The new departure in education," "The revolution in teaching," "The regeneration of schools," "Quincy justly the Mecca of teachers," "Six thousand visitors in her schools a year," "An exhibition so triumphant will carry all before it," "One half the school expenses elsewhere wasted," "Our schools hitherto all sham and shoddy,"—are not more extreme laudations on the one side than the current disparagements are on the other, when we read of Mr. Adams' "Monumental ignorance of schools outside of Quincy," "His reckless ignorance of facts," "Nothing new in Quincy," "The best features of the Quincy reform inaugurated long ago in many New England cities," "The soaring Quincy bubble," and "The Quincy quackery and that of Hop Bitters are equally well advertised." The schools of this town (population 9,155) have suddenly become celebrated to a degree unprecedented in the history of any town of its size in America. They have been so numerously visited by school superintendents, teachers, and newspaper reporters, even from distant cities and States, that restrictions were required to prevent the overcrowding of certain rooms, or interference with school work. Leading metropolitan journals have at great length described their achievements and eulogized their methods. A surplus of volunteers from abroad have tendered their services gratuitously as assistant teachers, that they might thus thoroughly learn the Quincy methods. Other teachers, after a visit of a single day or half-day, have sought to advertise themselves or their schools by public announcements, that henceforth their schools will be conducted on the Quincy plan. This great and sudden celebrity of the Quincy schools is primarily due to the able paper of Charles Francis Adams, Jr. The honored name of Charles Francis Adams, Sr., has contributed to this result. In various parts of the country I have found even intelligent professional gentlemen attributing this paper to the distinguished statesman who performed such eminent service during the late war as our minister to England. One of many illustrations that might be given will suggest the extent of this error. A president of a Western university, himself a Massachusetts man, says, "The attention which the experiment in Quincy has received is greatly due to the *illustrious name* of the man who should receive much of the credit of the experiment, but who published the results in language not altogether wise nor modest." But the "junior" in this family wields a vigorous pen, in no need of factitious aid, and for that reason the mistake of father for son is the more natural. Under these circumstances, an impartial account of the Quincy schools, with such criticisms and comments as will prove most suggestive to school superintendents and teachers, will meet a want widely felt. What the Quincy schools are, and the far more important inquiry, what all common schools should be and do, are the questions which this paper seeks to answer. These questions are now prominently before the country as never before, and no superintendent or teacher, worthy of his calling, can afford to ignore them.

It is my privilege to know something of both the old and the new in Quincy schools. In my ten years' service for the Board of Education of Massachusetts, I was called officially to every town of that State. In repeated visits to Quincy, I then found her schools manifestly inferior to those of the neighboring towns of Dorchester, West Roxbury, Brookline, and Newton. That inferiority, then too conspicuous to be questioned, was a matter of familiar comment with prominent friends of education in Boston and its vicinity. A recent inspection of the schools of Quincy showed that there had indeed been a revolution *there*, — a change so marked, and happy and suggestive, as to invite inquiry in relation to its causes, character, and results.

Such was formerly the condition of the public schools there, that the wealthiest families largely patronized private schools. Six years ago, the average attendance was only seventy-four per cent, which shows whether this class regarded public schools with pride or as "pauper establishments." Quincy, with all her wealth, stood among the lower half of the towns of the State, being the one hundred and eighty-eighth in a list of three hundred and forty-four, or sixteen below the average of the whole State. To-day she ranks as the seventy-second in the State, or just one hundred above the average. This means that in six years Quincy has risen one hundred and sixteen degrees in the scale of the barometer, which indicates the educational atmosphere of a town. Now her schools are justly regarded as good enough for the sons of the richest, and yet none too good for the children of the poorest.

This change, though nominally brought about by the agency of the school committee, is really due to the influence of the distinguished family so long and justly the pride of this town. Some five years ago Charles Francis Adams, Sr., delivered a commencement address at Amherst College, on the "Essentials and Aims of Higher Education," in which he traces certain crying evils to imperfect *early* training. In 1873, the school committee of Quincy, or rather Charles Francis Adams, Jr., who has inspired this movement, on a careful examination found their schools had fallen into a rut. To epitomize his statement, "A retrospect of ten years indicated no progress. The graduates of the grammar schools failed in speaking, spelling, and writing their own language. Not one in twenty of them could write an ordinary letter with ideas clearly expressed. When the committee took the examination into their own hands, the schools went to pieces. When called to read from a book new to the scholars, the result was bewildering. The children could neither write with facility nor read fluently, for they had been trained only for an examination, and turned into parrots, and were making a meaningless farce of education. Certain motions had to be gone through with, but for real results the teacher cared nothing. It was all smatter, veneering, and cram. To inaugurate a new departure, it was determined to employ a competent superintendent."

The three really new things at Quincy most essential to success are, —

1. The appointment of a liberal and intelligent committee who had clear and definite ideas of existing defects, and of the remedies needed.

2. The continuance of the same committee in office, for they commanded in a rare degree the confidence and continued support of the people. Rotation in office would have insured failure.

3. The appointment of an able superintendent, trained as a specialist, a man of good sense, great zeal and enthusiasm, and an indefatigable worker, patient in details, young at heart, and in closest sympathy with the children, and beloved by them.

These three conditions of success are happily and remarkably combined in Quincy. The school board, superintendent, and teachers have acted in entire harmony, — all intent on one end. This unity of aim has been itself an inspiration to teachers and scholars. The superintendent has had a free field, crippled by no fear of the jealousy or interference of the Board of Education, and he, in turn, gave the same liberty to all the teachers. While there was unity of plan, there was room for invention and diversity in details. The official criticism of the old system bore mainly on the grammar schools, but the specialty of Superintendent Parker was primary instruction. "Let me begin at the foundation, and I will warrant the right superstructure," was his motto. The revolution began with the alphabet, and extended into the last efforts of the grammar-school course. The new departure, therefore, started with the Quincy primaries, and it left little in them that has not undergone a change. Many of the Kindergarten methods were here introduced. Play-tables and Kindergarten desks were used, with blocks, forms, and Kindergarten gifts and occupations. The teachers were invited to secure, or were provided with numerous objects, natural curiosities, pictures on pasteboard, stuffed animals, and the like. The celebrity given to the schools by Mr. Adams' paper attracted many pupil teachers, some of them normal graduates, who were glad to serve without pay, that they might gain a thorough practical acquaintance with the principles and processes here applied. From numerous applicants, only the best were accepted. With this ample and choice corps of assistants, it was easy to divide each school into small groups of ten or twelve, and secure the constant activity of every child, and an unusual amount of individual teaching. Not a listless child is to be seen there.

It is not, however, *mere* interest or activity that can satisfy the true teacher. There may be activity and interest in a dance, in games of draughts or cards. Temporary expedients and a whirl of excitement may produce an unwholesome activity, an itching for mere novelty, fatal to quiet thought or habits of study. There may be agitation without progress, and commotion without execution. The indiscriminate clamor for "*life*, as the grand essential for teachers and pupils," sometimes leads to the use of stimulants as noxious to the mind as alcohol to the body.

The opportunities and causes of progress in the Quincy schools were exceptional in more than the three particulars above named. Their previous depression made their sudden elevation the more conspicuous. The volunteers summoned by the brilliant rhetoric of Mr. Adams rendered an important service in multiplying the number and reducing the size of classes, that cannot be elsewhere expected. The celebrity of the schools gave a remarkable stimulus to the pupils. Never did seven words so thrill an assembled host as when Napoleon said to his army, standing under the shadow of the pyramids of Egypt, "Frenchmen, forty generations look down upon you!" In like manner, the teachers of Quincy seem to have said to their pupils, "The educational representatives of forty millions of people are watching you." Their interest was frequently intensified by the inspection and laudation of distinguished visitors from different and often distant parts of the country. That sort of inspiration is not altogether natural or healthful, and there need be no regrets that it cannot be generally felt.

Mr. Adams' chief points in his criticism of the old methods were the inability of the scholars, even the graduates of the grammar schools, to read and write their vernacular properly. Beginning in the primaries, Col. Parker at once gave the greatest prominence to reading and expression, both oral and written. Adopting the word system, they began writing in script at the outset. Discarding for the first six months all books and printed matter, except pictures, reading and writing were taught and practised continually, both on the blackboard and slate. Tact and didactic skill are needed in nothing more than in the first steps in teaching reading and spelling.

Every study should be pursued not as an end, but as a means of training the faculties. Rightly taken, even the first steps in reading and spelling, instead of being a monotonous and mechanical drill, may be made an attractive *intellectual* exercise, cultivating the eye and conceptive faculty by observing the *form of each word as a unit*, just as one would look intently at a house, a dog, or robin, who intended to draw the same from memory. It is an important art to learn how to *see* so accurately that one's conceptions of visible objects may be as clear as were the original perceptions. This art, developed in reading and spelling, applies to all objects of perception and description, and thus the child early gains a priceless power which enters into all the higher operations of the mind in natural science and history, in poetry, in the fine arts, and, indeed, in all description.

Col. Parker wisely applied the theory that reading is by far the most important study taught in our schools. Its early mastery is here proved to be the surest way to facilitate all other and higher studies, fostering a love of school and fondness for books. Formerly, aversion to study and hatred of school were produced by tasking children in grammar and the higher studies before they could readily read them. Once implant a love of reading, and you have a strong pledge of scholarship through life. Let a child learn to read with facility and expression, and he has gained the key by which he can open any door in the temple of science. But so long as a child finds it a toilsome tug to "spell out" the words, he can take no pleasure in reading, and therefore reads little. Whoever knew any man fond of books who retained the childish habit of moving his lips as he deciphered the words?

Of course the old *a, b, c* method was at once abandoned when Col.

Parker made his influence felt in the primaries, as indeed it had been discarded for many years by the best teachers of New England and of the country. That its expulsion from Quincy awaited Col. Parker's advent is another decisive proof of the previous low condition of the schools of that town. The progressive teachers of Massachusetts and of the country, for a score of years, have condemned this exploded method as strongly as Mr. Adams now does. His heavy blows are struck with the vigor of one who is consciously commissioned to slay that monster whom the best teachers of the whole country regarded as dead and buried years ago. No doubt there remain dark by-ways where this obsolete method still lingers, for old usage as well as error dies hard. One cannot but smile, however, at Mr. Adams' evident innocence of educational affairs out of Quincy, when he thus describes "so daring an experiment" in "the new departure": —

"The drudgery of the alphabet was gone. It was robbed of its terrors, and stole upon them unawares, while the most confounding thing to the members of the committee was, that in hearing the primaries read, not a child among them could repeat his letters.* *So daring an experiment as this* can, however, be tested in but one way, — by its practical results, as proven by the experience of a number of years, and testified to by parents and teachers, as well as observed in children. The method has now been four years in use in the schools of Quincy, and has ceased to be an experiment; its advantages are questioned by none, least of all by teachers and parents. Among the teachers are those who, having for many years taught class after class in the old way, found themselves called upon to attempt with deep misgiving the new, and to them mysterious process. The ways of nature are the easier ways. After all, the lesson is not a very profound one, and it is strange indeed that it took so long to find it out. A child learns to talk and to walk, — the two most difficult things it is called on to learn in its whole life,— without any instruction, and by simple practice; the process of learning is not painful to it or wearisome to others; on the contrary, it is an amusement to both. Why the same process should not have been pursued in other and less difficult branches of education, is not apparent. One thing only is clear: *it was not pursued.* In place of it, an arbitrary system of names and sounds, having no significance in themselves, was adopted; and with these generation after generation of children have been tortured. Only *now* do we deign, in imparting knowledge, to give any attention to natural processes which have forever been going on before our eyes and in our families, and yet we profess to think that there is no science in primary education, and that all there is to it can be learned in a few hours. The simple fact is, however, that *within these few years* it required a man of absolute genius to discover how to teach the alphabet. The new departure, therefore, started with the Quincy primaries, and it left little in them that had not undergone a change. The reorganization was complete."

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* The italics are ours.

Had Mr. Adams ten years ago visited the schools of St. Louis, under the supervision of Dr. Harris, or those of Cincinnati, then under John Hancock, of Cleveland, under Superintendent Rickoff, of Oswego, N. Y., under Superintendent Sheldon, the *model* school in Westfield, under Hon. J. W. Dickinson, many of the primaries in Boston, especially that truly model school under Miss Jennie Stickney, or the primaries of New Haven, under Ariel Parish, not to name many equally good in other States, he might have seen the same work done as well, and children as early and thoroughly trained in reading. "First Steps in Reading" was a topic discussed at length in my first Teachers' Institute held in Connecticut, more than thirteen years ago, when the plan of printing or writing words from the outset, ignoring the names of letters, was advocated. Substantially the same views were urged during the previous ten years in the institutes of Massachusetts, from which the teachers of Quincy were then conspicuously absent.

Whether the script alone should be used from the start, as in Quincy, and Bridgeport, Connecticut, or printing, the first year, and script thereafter, is a minor matter. The question of the word or phonic method at the outset is non-essential. The phonic method teaches the sounds of the letters the first fortnight, and then carries all the advantages of the word method, including the rapid recognition of words as units. The tact and skill and enthusiasm of Col. Parker would, I doubt not, secure as good results in one way as the other. The remarkable success of Dr. Harris with the primary schools of St. Louis has been achieved by the use of the phonic method, so long and generally used in teaching reading in Germany, Italy, and other European countries, and so generally indorsed by the most eminent educational experts of the world, based, as it is, on true philosophical principles. The word method, though in use long ago, has been several times re-discovered, when a better knowledge of the past would have saved that strain of inventive "genius."

Another prominent aim of Col. Parker in the primaries was to train the senses and form habits of careful observation of common things. He recognized the fact that the child's intellectual life begins with the reception of impressions from the senses, which are the windows of the soul. The noblest of these, and the royal avenue to his mind, is the eye. From the outset this is busy with form, as seen first, perhaps, in its hand, its mother's face, the kitten, the window, and other common objects in the nursery. The child recognizes hundreds of things by their *shapes* before he can count three.

In the new education, Nature becomes the great teacher. Facts, objects, common things, are made the leading instruments of developing the faculties of the juvenile mind. Plato well said, "The Deity delights in geometrizing, for the world itself, and everything in it, is built after some geometric form or combination of these forms." Accordingly a large portion of the course of study printed during the last year to guide the teachers of Quincy is occupied with lessons in form. If youth should be trained to study nature, should we not give them the few exact forms which, singly or combined, are the patterns of all visible objects? As the child's mind naturally turns to form and size, if untaught in them, his notions will be vague; but if trained in these elements of geometry, his perceptions are likely to be distinct and accurate. The majority of our pupils will never pursue geometry proper, but all should learn its forms. These ideas and terms will be especially useful to the carpenter, joiner, mason, worker in tin, or any metal, or at any trade.

Form enters into all our perceptions, descriptions, comparisons, imaginations, calculations, and indeed into all the arts and occupations of men, — into the very texture of daily life. It has been said that these geometric elements are too difficult for the primaries. But the experience of many schools in Germany and in America, as well as at Quincy, shows that these elements are simpler than the first processes in arithmetic. Ideas of extension are more elementary and *attractive* than those of number. The relations of place, form, and size are among the earliest conceptions of the juvenile mind. The supposed difficulty of the subject is imaginary. The experience of thousands of primary schools at home and abroad shows that form is one of their earliest, easiest, pleasantest, and most useful occupations. With the gonigraph in hand as a sort of magic wand, the youngest children in all true kindergartens delight in making triangles, squares, rhombs, rhomboids, oblongs, pentagons, hexagons, circles, and other forms. Because they are made with facility and rapidity by their own little hands, these forms are understood and remembered.

In the primary schools of Quincy all are busy, and all is life. Col.

Parker visits them not as a mere spectator, for he habitually turns teacher. With crayon in hand he is a worker, by turns, in all the grades. His earnestness and enthusiasm give encouragement and stimulus alike to teacher and scholar, and it is inspiration that is everywhere needed even more than mere instruction,—or rather the great want is such instruction as shall awaken self-reliance and enthusiasm, and prompt the child every day to win some victory, and go on from strength to strength. The child then feels that he is doing something, and this consciousness of achievement gives pleasant memories of the past and stimulus for the future. In visiting schools, it is often sickening to see what a dreary, monotonous, stupid task the exhilarating work of study becomes, from the want of fit incentives and methods. You witness a sluggish, passive receptivity, or a mechanical movement fatal to all joyous activity. Happy the child whom a skilled teacher has inspired with such taste for study as will prompt and sustain spontaneous effort. Joy and hope ever attend true energy. They quicken the mind as gloom and discouragement suppress its life. The one awakens interest and attention, the other produces heedlessness and indifference.

Col. Parker has wisely aimed to stimulate the *curiosity* of the children from the outset, realizing that curiosity is the parent of attention and memory. Curiosity prepares the soil and fertilizes the seeds of truth. A farmer might as well sow a field without ploughing, as a teacher instruct pupils in whose minds no love of knowledge has been awakened. Curiosity, or what is kindred, love of knowledge, is one of the strong natural desires which God has planted in the heart of every child. Though too often dormant, it may become one of the vital forces in education. However strong in childhood, it should grow with years and attainments. When this is not the result, such stinting comes from our blundering. Though at first a restless instinct, under fit culture it will mature into an insatiable desire, a ruling passion. Curiosity is to the mind what appetite is to the body. It creates a hungering and thirsting for knowledge, which alone is the mind's food. Love of truth was as strong a passion with Newton as love of conquest with Napoleon. Under its healthful inspiration study is a pleasure, without it a task; the dullest drudgery, "the weariness of the flesh." Curiosity is the primal desire to which the child's nature responds; it is the impelling power to which genius, when enriched with the treasures of science, is most susceptible. What at first is but a blind impulse, becomes an insatiable desire to observe and discover. The most bountiful supplies only add fuel to the flame. Instead of surfeit, there comes an intense craving. Each new attainment gives strength and stimulus for higher acquisitions.

The most serious charge of Mr. Adams against the old system was its failure to develop the power of expression. With his sentiments on this point I have long been in sympathy, and have often said that just here is the greatest deficiency of American schools as compared with the best schools of Switzerland, Germany, and England. With us, nothing of equal importance is so underrated and neglected as the culture of the expressive faculties. Until recently grammar was the only study in our curriculum professing to teach how "to speak and write the English language correctly." As ordinarily taught to children under twelve years of age, it has about as much adaptation to its professed design as the study of physiology and anatomy would have to swimming. Useful as grammar is, it is a difficult study, kindred to rhetoric and logic, and above the grasp of young children. In Quincy, grammar was summarily put out of school, and daily exercises in talking and writing put in. The result is that the children write English earlier, write more and write it better *throughout all the schools of the town* than is the case in *all* the schools of any other town within my knowledge in our country. Individual schools can here and there be found in this respect equal to any in Quincy. The pen or pencil continually in hand has made the Quincy scholars facile and felicitous in expression. They learn words by using them, phrases by making them, and sentences by writing them. Conversation is one of the attractions of the Quincy schools, as it is of the well-regulated home. "What did you do last evening?" or "What did you see on your way to school this morning?" are specimens of many simple questions to invite habits of observation, and then of "telling the teacher." Thus conversation was cultivated as an art. So should it be in every primary school.

To teach how to talk well should be the constant aim of both home and school training. Conversation should be regarded not merely as an art, but as a fine art, indeed the noblest of the fine arts, and therefore should be cultivated with the zest of the amateur in painting and sculpture. Carefully practised, it becomes a prime educator, awakening curiosity, sharpening perception, cultivating attention, quickening both the memory and imagination, and developing versatility, tact, and vivacity. In view of the range and grandeur of its subjects, the greatness of its influence, and the brilliancy of its victories, speech is the grandest of *all* arts. The leaders of men in every age have gained their wide sway by this divine gift of speech. The greatest triumphs of truth are won by the tongue. Though it is "a little member," it justly "boasteth great things."

The culture of expression includes and promotes that of all the other faculties. Perception, conception, and memory, fancy and imagination, the taste and sensibilities, the powers of imitation, personification, and representation should be trained by and for expression, for without it all these powers, imprisoned within the soul, would droop and decay. That "crime against a human soul," as Prof. Fauerbach calls the history of Kasper Hauser, illustrates the sad effects of long isolation and enforced silence. The soul, like a lake, grows stagnant without an outlet. Thought itself falters when language fails. Felicity of expression favors clear thinking, as much as exact logic helps language. A linguistic taste fosters that love of literature and fondness for books which, like a divine light, will illumine the scholar's daily life.

Language is the grandest product of the human mind, at once the means and measure of its growth, the greatest instrument of human investigation and progress. It is the index alike of individual and national character. The refinement of the Greeks is still told by their tongue. Now, as of old, whether barbarian or Greek, boor or scholar, one's speech "bewrayeth him." Language, too, has a moral bearing. Words *influence* as well as indicate character. A slovenly style, like a slatternly dress, suggests and promotes want of self-respect, if not purity, and tends to demean and degrade. As "evil communications corrupt good manners," so a diction terse, refined, and rich in noble thoughts, fosters every virtue. Or to put this gem in its own sacred setting, "A word fitly spoken is like apples of gold in pictures of silver."

A true workman must be master of the tools of his trade. The teacher's tools are both ideas and words. But language is the vehicle and vesture of his thoughts. Though thought is first in the order of time and importance, it can be fully developed only through expression. Strictly speaking, things come before names, and ideas before words, but practically they should be conjoined, for language is the casket which holds the ideas. The child should be treated as an active as well as a receptive being, one who can give as well as receive. He instinctively longs to speak as well as to hear. One of his earliest needs is aid in utterance. The first aim should be acquisition of ideas by objects, and then their fit utterance by words. But repression, rather than expression, is often the result if not the aim in school. The talking is by the teacher when the pupil should first *see* and then describe. The teacher should not directly tell a child anything which he can be stimulated to find out by his senses or reflection. A single fact or truth which he discovers for himself is worth a thousand which he passively receives. Every discovery and description thus made facilitates others, and forms the habit of observation. Every fit description once given helps in the future command of language and fixes the facts described in memory.

In the schools of Germany and Switzerland, scholars write tenfold more than usually in America. The prominence there given to the study of the vernacular is largely due to the influence of Père Girard, whose motto was, "The mother tongue the great educator." Well would it be for the youth of America if some Père Girard would as effectually ring the changes on this cardinal maxim in this country. Every school exercise, even the dryest drill in arithmetic, may be a language drill, if the class are always kept on the alert to notice (and correct when corrections are called for) all errors in language. If a pupil can give an answer in fewer or better terms than those used by a classmate, let him be encouraged to do it. Thus a generous rivalry may be awakened in the use of felicitous language. In the German schools, the exercises are far more conversational than with us. The text-books are thoroughly studied by the teacher as well as by the pupils, and in all recitations, except in ancient or modern lauguages, the teacher has no text-book in hand. To use one would be a confession of ignorance of which a German teacher would be ashamed. Hence, in the recitation, there is far more of direct contact of mind with mind, of question and answer, of inspiration and correction, than formerly with us. The best American teachers, however, are now widely adopting this method, and with good results.

An inspection of the schools of Quincy as they are now, contrasted with their former condition, convinces me that the recent progress has been striking in the following particulars:—

1. There is a great increase of interest on the part of the pupils. They form a company of earnest and cheerful workers.

2. There has been a remarkable advance in the interest of parents and the people at large. The citizens of the town are now proud of their schools, and frequently visit them. The condition of schools everywhere answers to local public sentiment. You awaken parental sympathy and co-operation by improving the schools, no more surely than you improve the schools by intensifying popular interest.

3. There has been an increase in the aggregate attendance, as well as in its regularity and punctuality. No truant officers or truant schools are needed in Quincy.

4. There is far better reading and spelling. Great excellence is reached in these branches, especially in "sight reading," so called.

5. The training in expression is remarkable. The scholars have learned to talk and to write well. They can tell what they know.

6. Habits of careful observation, as well as exact description, have been formed. To describe actions is often more difficult than to describe objects. To test one school in this matter, I went through a succession of gestures and gymnastics, and called upon the scholars each to write a narrative of my pantomime. The result was a pleasant surprise to me in the fulness and accuracy of the description, and the propriety of their language. They see quickly, and can tell what they see.

7. There is here an unusual amount of individual teaching. In our system of graded schools, with all their advantages, when properly conducted, too many teachers see and teach only classes, when the true instructor (or, as the term implies, the inward builder) is building up individual pupils. His words impress an entire class all the more, when each is wont to receive them as a personal appeal. That power goes not out from the "schoolmaster," who treats all minds as if they were cast in the same mould, and, like so many coins, were to be stamped by the same die. A teacher must *learn* his pupils, before he can successfully teach them. He must make each child a study, to find out the strong and weak points of both mind and heart, as a discriminating physician watches closely the symptoms of his patient. Until he does this, he must work in the dark. There is a great variety of methods of illustrating each branch, and only the teacher who understands both his profession and the character of his individual pupils can adapt these countless varieties of method to the endless diversities of mind and character.

The difficulty of understanding little children is exceeded only by its importance. The internal history of a child is veiled from us, because it lies so far back of our present experience. In our eagerness to "put away childish things," we too soon forget how we "spake as a child, understood as a child, and thought as a child." "Put yourself in his place," should be the motto of the teacher. By thus becoming childlike, renewing his youth, reproducing his own early feelings and difficulties, the teacher can best prepare himself to meet the wants, weaknesses, and primal aspirations of the juvenile mind. He who can thus come down where children are, and be a child again, instead of growing old in heart with advancing years, will ever maintain that rare grace and beautiful ornament of age, the vernal freshness of youthful feeling. Such vivid reminiscences of childhood, and such knowledge of the juvenile character, bring the teacher into close contact and conscious sympathy with his pupils, open their hearts, and win their love.

8. Col. Parker has taken great interest in dull and backward pupils. From the large number of applicants and volunteer teachers, he has made choice selections to fill vacancies. It was well understood that want of success would create a vacancy, and that success would be tested by one's treatment of dull and backward pupils. Unfortunately the opposite theory and practice generally prevail. The backward scholars, who really need most help get the least, and the special efforts are devoted to the precocious and brilliant. It was one of the many traits that combined to make Dr. Arnold the model teacher, that he showed such sympathy and patience with backward boys. Precocity is by no means a sure promise of preeminence in life. Strong and gifted minds sometimes mature late. Many a backward boy, deemed a dullard by an early teacher, has developed rare ability when inspired by a competent teacher.

9. With the above facts in mind, it goes without saying that there is a marked advance in the *morale* of the schools. This is a point of supreme importance. The pupils are interested because they are constantly and happily occupied, and are daily conscious of making substantial progress. Of course tardiness, irregularity of attendance, and truancy reach the minimum. "Every day is a new leaf in your history," seems to be the motto of all, or rather the better one of Emerson, "To-day is a king in disguise." A new inspiration comes to every pupil who discovers the royal dignity and value of to-day, and so prizes *the now* as to make it rich in results. The tempting thought of youth often is, "To-morrow or next week, or next month, or next year, then, oh then, I will wake up and do something." But their achievements are always in the future, who slight *to-day*.

10. In geography the use of the moulding-board has made them familiar with reliefs, and for this purpose it is a happy device, but the contours of different countries and of the continents are more difficult to imprint upon the mind than the reliefs. On the moulding-board but one or two work at a time, and usually the work is done by the teacher, though all serve as critics. But on the motto so well carried out at Quincy in all other departments, that children learn best by doing, I doubt the wisdom of making the moulding-board so prominent, and of doing this work for the children instead of leading each to mould for himself. Within narrow limits it is very useful, but as a didactic drill, and as an aid in training in observation, memory, and description, it is not comparable with the more

general practice elsewhere of daily exercises in map-drawing from memory. Even the relief maps so common in Switzerland, however admirable and useful, are by no means an equivalent for our method of daily practice in "memory maps." In this particular, our best schools surpass anything which can be found in Europe. Two English school inspectors, familiar with the best schools of England, Switzerland, and Germany, after witnessing the map-drawing in one of the schools of New Haven, said, "That exercise and that method of teaching geography far surpass anything we have ever witnessed in Europe." The reliefs are represented by colored crayons almost as vividly as by the moulder's earth, by which the elevations are often enormously exaggerated in their relative proportions. In all our best schools pupils study the maps and recite them by making them, and often making them every day and always from memory. That I may not seem partial to my own State, I will say that, in my judgment, geography is taught generally in the schools of New Jersey better than it is in Quincy. Their memory maps at the Centennial Exposition surpassed those from any other State, and they included specimens from nearly every school of the State. I advise any sceptics to visit the schools of New Jersey for confirmation of this view. On their journey thither I invite them to inspect the classes in geography in the Dwight School of New Haven.

The attainments of the Quincy schools in arithmetic are in nowise remarkable, and, in the important matter of rapid mental combinations in figures, are far inferior to many elsewhere. They do not promise a surplus of rapid reckoners or first-class accountants. With all the acknowledged progress there made, the people of the Bay State are not likely to admit with Mr. Adams, that "the statistics of the Board of Education show clearly enough that an annual waste of some two millions a year is now regularly going on in Massachusetts from the lack of a pervading and intelligent direction of expenditures for solid purposes."

Col. Parker does not join with Mr. Adams in his somewhat indiscriminate disparagement of the schools of Massachusetts, but says, in relation to the history of education in that State, "We have inherited victory. A rich inheritance is ours, fellow-teachers, of Massachusetts. He is a shallow critic, a builder unmindful of foundations, who despises the past because something better can be done in the present. A foundation laid deep and strong is ready for the superstructure. Nowhere in the world has there been such a grand foundation laid for the truest, best education, as in our Commonwealth. . . . We have nothing new in our schools (at

Quincy). The same methods have been used for years in Germany and in this country. I claim nothing new whatever."

The grand success at Quincy, carrying the most improved and approved methods alike to all the schools of the town, shows the value of skilled supervision. Mr. Adams says of the result, "This was entirely the work of Supt. Parker. The committee simply gave him a free field to experiment in, and the result fully justified them in so doing." The simple fact is, that frequently meeting his teachers, and imbuing them with his zeal, he has become in all the schools, omnipresent with his enthusiasm, magnetizing every teacher and scholar, suggesting improvements, correcting errors, and giving unity and efficiency to the whole system. While the time-table programme was nominally abandoned, his frequent presence in every school has kept all up to the standard he required.

Mr. Adams deserves great credit for the time and thought and heart he has devoted to the question of common-school education, and especially to the radical defect of neglecting to train our youth in the use of our own language. The examination of hundreds of schools and thousands of pupils by Mr. Walton, fully confirm all he says on this point. Public attention has been called to this leading defect of our schools as never before, and great good will come from this discussion. Some obvious exaggerations in Mr. Adams' paper on other points are not unnatural, and certainly are pardonable in view of the great service he has rendered to Quincy, and to the cause of education throughout the country.

SCHOPENHAUER ON EDUCATION.

TRANSLATED BY G. A. HILL.

[The German philosopher, Arthur Schopenhauer, whatever may be thought of his philosophy and its tendencies, possessed one of the most original and powerful minds that has ever existed. He spent his life in thought and meditation, in assimilating knowledge derived from all sources, and in fashioning therefrom his own views upon the great problems of life. The matured views of such a man upon the subject of education are eminently worthy of attention. They were condensed by him in a short essay on "Education," which appears to have been written near the close of his life, and a translation of which is given below.

Schopenhauer believed that the best education, both as regards matter and method, is that which best fits a man to grapple successfully with the practical questions of life, — the questions which every child has to face when it enters upon the active duties of life. In this general statement, all educators would agree; but the striking feature of the essay is the emphasis laid upon the natural order in the development of general ideas. It is here that the experienced and successful teacher will quickly recognize the hand of a master, of one who was both a profound psychologist and a self-trained thinker.

It may be well to say that the word which is here translated *intuitions*, includes everything which is immediately known to us in consciousness; not only sensations, but feelings, emotions, memories, and mental images in general. This is the meaning which the word intuition in English ought always to have. — *Translator.*]

I.

It is in harmony with the nature of our intellect that *general ideas* should arise through abstraction from *intuitions*, hence that the latter should exist before the former. When this course is actually followed, as in the case of a man who has only his own experience for both teacher and text-book, the man knows perfectly well just what intuitions belong to each one of his general ideas, and are replaced by it; he has a precise knowledge of both, and accordingly acts rationally under all circumstances. This is what may be called *natural* education.

On the other hand, in what may be termed *artificial* education, the head is crammed with general ideas by means of lecturing, teaching, and reading, before there is any acquaintance, to speak of, with the real world of objects and sensations. Here the intuitions corresponding to these ideas must be acquired after the education; till then, however, the ideas are wrongly applied, and hence both men and things are wrongly viewed, wrongly judged, and wrongly treated. In this way it comes to pass that education makes warped minds; hence it happens so often that, after much learning and reading, we step into the world full of silliness and perverseness, and in our conduct are either too timid or too headstrong. We have plenty of ideas which we want to put to use, but we put them almost always to a bad use.

All this is the result of that "last first," whereby, contrary to the natural order of mental development, we acquire general ideas first, and intuitions afterward, simply because educators, instead of aiming to develop the *power* to perceive, to compare, and to reason, are mainly occupied in cramming the head full of strange and complex general ideas. It requires a long and bitter experience in after-life to correct the judgments which come from false applications of these ideas; and seldom, indeed, is even this equal to the task. This explains why the learned are so often lacking in that sound common-sense which we find so frequently among the unlearned.

II.

From what has been said, it follows that the first essential in education is that the *knowledge of the world,* the attainment of which is the aim of true education, should *begin at the right end.* And how this is to be realized is also obvious; *in every subject intuitions should precede general ideas, and the narrower idea the wider one, and thus the whole structure of knowledge be built up in the exact order in which one thought suggests another.* The instant a link in the chain of thought is omitted there arise imperfect ideas, and from imperfect ideas false ideas, and finally distorted views of the world, of a kind more or less peculiar to the individual, and such as we see most people carrying in their heads for a long time, — in a majority of cases through life. He who examines himself will discover that the correct or the clear comprehension of many simple matters and relations first dawned upon him at a late period in life, and sometimes very suddenly. Now these were dark spots in his knowledge of the world, owing their origin to omitted links in the chain of thought in early education, whether natural or artificial.

We ought, therefore, to try to discover the natural order in the development of ideas in the different branches of knowledge; and then we ought to impart to children knowledge about things and the relations of things methodically, and in harmony with this order.

This is the only way to prevent shams and false notions from entering their heads, which, once settled there, are so hard to dislodge.

[Here Schopenhauer adds in a foot-note: Even children, as a rule, have the unhappy tendency to rest satisfied with words instead of trying to understand things, and to commit the words to memory, in the vain hope, with their aid, to help themselves out of difficulty on future occasions. This tendency at last becomes a life habit, and is the cause why the knowledge of so many learned men is mere word-cram.]

The main thing is always the same: intuitions should come before general ideas, and not the reverse, as is usually, but most unfortunately, the case.

Thus it is the fashion, while the mind of a child is almost destitute of objective knowledge, to indoctrinate him with ideas and opinions, or rather prejudices; with this finished apparatus he then comes to observation and experience, instead of which his ideas and opinions ought to have been derived from his observation and experience. The knowledge of objects is boundless and many-sided; herein it differs from the abstract idea, which is quickly stated in a complete form. Whence it follows that observation and experience are seldom able to finish the task of correcting preconceived ideas.

So it comes to pass that many a man journeys on through life burdened with shams, delusions, fancies, and prejudices, which finally become settled convictions. He has never made the attempt to form his own ideas from his own experience; he receives them ready-made from the hands of others; it is precisely this that makes him, makes countless men, so weak and shallow.

In place of this, in childhood the course dictated by nature in the growth of knowledge ought to be carefully followed. No idea should find entrance into the mind save through the appropriate intuitions, at all events not without being verified. In this way the child would acquire few, but well-grounded and true ideas. He would learn to measure things with his own rule, not with that of somebody else. He would not lay hold upon a thousand whims and prejudices to the outrooting of which the best part of his future life must be devoted; and his mind would, from the very start, accustom itself to solidity, clearness, independence of judgment, and freedom from prejudice.

In particular, children never ought to know life in any point of view earlier from a copy than from the original. Instead of hastening merely to put books into their hands, we should try to make them familiar, step by step, with actual human affairs and relations. Before all else take care to lead them to an adequate comprehension of what is *real*, to bring them to such a point that they will always derive their ideas straight from the actual world, and form them into harmony with the conditions of real life; and take care that they do not obtain their views and opinions from any other source, such, for instance, as novels, fairy tales, conversation, etc. When this last happens, — when, with a ready-made stock of ideas drawn from such sources, and consequently with the head full of chimeras, — a man comes to face the real world, on the one hand he misunderstands it, and on the other hand he continually worries himself with fruitless efforts to remodel it according to his chimeras; and so he falls into theoretical, or, what is far worse, into practical follies. It is really inconceivable how much harm results from chimeras implanted in early life, and the prejudices that grow out of them; all subsequent education gained from real life has to be devoted mainly to the task of expelling them.

Hence the answer of Antisthenes, as reported by Diogenes Laertius (VI., 7), when asked what kind of learning was most necessary: "*To unlearn bad things*," replied he.

III.

Since the errors sown in early life, as a rule, are ineradicable, and since the faculty of judgment is the last to reach maturity, we ought to keep children till the age of sixteen, at least, aloof from all subjects in which serious errors may exist, — hence, from philosophy, religion, and from general views of all kinds, — and allow them to study only subjects in which either errors cannot exist, as in mathematics, or in which the errors are not dangerous, as in the languages, natural philosophy, history, etc. And we ought to be very careful to introduce in each period of childhood only such subjects as are suited to it in respect to difficulty, and in every sense perfectly intelligible. Childhood and youth are the time to collect data, and to acquire, first-hand, a knowledge of the single and the individual; while judgment in reference to what is general ought to be kept in suspense, and final explanations to be deferred till much later. Let the critical faculty, which demands both maturity and experience, remain in repose; and do not try to anticipate its growth at the expense of inculcating prejudices, and thereby making it a cripple for life.

On the other hand, the memory possesses its maximum strength and tenacity in youth, and therefore claims the utmost attention, the selection of topics, however, being made with extreme care and consideration. For, since whatever is once thoroughly impressed in early life on the memory always remains there, this precious store-house of the mind ought to be used to the greatest possible advantage. When we reflect how deeply graven on our memories are the faces with which we were familiar during the first dozen years of our life, and how, also, the events of that period, and, in short, everything that we then saw, learned, or experienced, is indelibly stamped upon our minds, surely it is a very natural idea to make this youthful sensibility and tenacity the basis of education, by regulating all the impressions which the young mind receives according to a judicious and systematic plan. Now the period of youth is short, and the capacity of the memory is limited, so that everything depends on selecting in each subject that which is most essential and important to the rigorous exclusion of all the rest. This selection should, in the first instance, be made by the ablest men, and by the confessed masters in each subject, after the most careful consideration, and their decision should be accepted as binding. As the basis of the selection, there should be a thorough sifting of that which is necessary or important for all to know, from that which belongs to each particular craft or line of business. The knowledge of the first kind should then be graded in wider and wider courses, according to the different degrees of general culture designed for different persons, and keeping in view their different circumstances in life, from the essential elements of the primary school to the most comprehensive courses of study in the university. The choice of knowledge of the second kind should be left to the acknowledged masters in each specialty. The whole would form a detailed exposition of the rules for intellectual education, which, of course, would require revision every ten years or so.

By a plan of this kind, we might utilize to the best advantage the strength of the youthful memory, and insure a rich supply of material for the judgment to work upon when it arrived at maturity.

IV.

Ripeness of mind — in other words, the degree of perfection which mental action can reach in each individual — depends on the attainment of perfect harmony between the abstract ideas and the intuitions; a harmony such that each idea rests immediately or mediately upon an intuitive basis, which alone gives it any real worth, and also such that the man is always able to bring an intuition under the idea which is appropriate to it.

This ripeness of mind, however, is the work of experience, hence of time; for, as we acquire our intuitive and our abstract knowledge, for the most part, in separate ways, the first naturally, the last through teaching good and bad, and information received from others, the common result is that in youth there is very little agreement and correspondence between our ideas gained through mere words and our real knowledge derived from experience. Both come by slow degrees nearer together, and tend mutually to correct each other; but only when they have grown into complete union do we behold the full maturity of mental action. This maturity is quite independent of the greater or less perfection of the individual powers in other respects, inasmuch as this latter depends, not on the *connection* between abstract and intuitive mental action, but on the separate intensity of the two.

V.

For the practical man, the most important study is the acquisition of an exact and well-grounded knowledge of *how things really go on in the world.* But this is also the most tedious of studies, for it continues to the very end of life; while, in the so-called sciences, the main facts may be mastered in youth. In this field of knowledge, the boy and young man must take, as a tyro, his first and hardest lessons; but how often must also the man of ripe years review and readjust his knowledge! The intrinsic difficulty of the subject is largely increased by reading *romances*, which represent a course of events and of human conduct that has no real existence whatsoever. These false representations are swallowed with the credulity of youth, and mentally digested; and the consequence is, that, in place of mere negative ignorance, we have a whole tissue of absurd notions and positive errors, which, later in life, are sure to vitiate the lessons of experience, causing them, also, to appear in false colors. If the young man, at first, was moving in the dark, now he is led astray by treacherous lights. With girls the result is often far worse. Through romances, totally false views of life are presented to them, and hopes are aroused which can never be realized. All this has, as a rule, the most unhappy influence upon the whole course of life. In this respect men, like poor laborers and artisans who, in youth, had neither time nor opportunity to read novels, enjoy a positive advantage.

Few works of fiction can be excepted from the above charge, or rather can be said to operate to the good of the reader; among them, and before all others, "Gil Blas," and the other works of Le Sage (or better, their Spanish originals); further, the "Vicar of Wakefield," and some of Scott's novels. Don Quixote may be regarded as a satirical picture of the very course of error of which we have been speaking.

MORAL TRAINING IN OUR PUBLIC SCHOOLS.

BY GEORGE HOWLAND, A. M.

THERE are currents and tides of thought, as well as of wind and wave, — times when certain topics seize upon the public mind, and, whether we will or not, demand a hearing.

The question of the claims and the usefulness of the higher schools is fast passing away with the hard times, in which it had its source, and from the ruins of fortune and reputation it is but natural that men, and thinking men, should turn to search for the springs of this wide-spread desolation.

And if in the decade following that of the rapid development of the high-school system in our land be that when, above all others, integrity is a myth, and honor a by-word, is it not fair to dwell there for a little, and examine into the nature and workings of the system, whether there be a deadly taint in the very streams that supply our homes, our counting-rooms, our temples of justice, and from which we fill the baptismal fonts upon our altars? We need not, then, be surprised or disheartened, when from the occupant of the pulpit, or the platform, or the editor's chair, come complainings, doubts, and questionings as to the moral training of our public schools. We need not be offended, though many an honest and wondering citizen, listening, in ignorance of the cause, to their clamor, like Gilpin's neighbors, thinking they carry weight, cry out, "Well done!" to their unguided and unrestrained career, but rather should we throw wide our gates to let them pass, glad by any means to learn the truth, and apply, if need be, a remedy. For in a land like ours, if the public school has any leave to be, it is from its being a sure and efficient helper in making intelligent, industrious, and upright citizens.

It were easy to show, if such were the purpose of the hour, that much of the apparent dishonesty of the last few years — the unredeemed promise, the broken obligation, the violated trust, the commercial and official degradation — was, in a manner, forced upon unwilling victims by the unyielding laws of value, as estimated by a worthless measure, — laws by which the enterprising, the public-spirited, the large-hearted, were not seldom the first and greatest sufferers, rudely wakened from their fevered dreams of uncoined wealth to the reality of want, hopelessness, and dishonor.

That the school, by the quickening of the intellect, and the inspiration of new hopes and higher aims, may have disturbed the rest and content of the lowly, we would not deny; but rather claim, and glory in the belief, that every child of the school, if not of the soil, whether his inheritance be reached by the course of the National Academy or by the tow-path, is born to a birthright of progress and honor.

The severest censure of our school system often comes from those who, in acknowledged ignorance of the schools of to-day, speak from the memories of their own experience of a generation ago, seemingly all unconscious of the fact that the school has kept fully abreast of the advance in other departments of social and moral progress, of which their own charges, if rightfully regarded, would afford the most conclusive proof.

A few weeks since, while riding with a friend through the suburbs of an Eastern city, we drew up our horses upon a height, from which, across an intervening valley, we had a full view of the busy town lying beneath a summer sky, seemingly embowered by green groves, with their suggestion of soft lawns, cool shades, and sparkling fountains, and the sweet scent of fresh verdure, with here and there a white spire pointing through to the purer blue above, and with the outlying farms of thrifty orchards, and fields of grass and grain, almost rivalling Lamartine's picture of Damascus.

My friend said that an old citizen, long familiar with the dusty streets, on seeing a photograph taken from the same point a few days before, had remarked that the artist must have had a vivid imagination, as there was nothing of the kind there.

So, as with a sort of filial tenderness we turn our thought to the old home and school of our early days, the green memory of some task or sport — some new book begun, or old one finished, some hard problem solved, the snow fort, with the gallant assault, or defence, the splendid slide down the long hillside, the brake booth by the road, or perhaps some sweet, childish friendship — seems to fill the whole field of view, and it is with a sigh of regret that we compare the present with the dear old days.

But when from the old chest in the garret we bring forth a fragment of the old thumb-worn, dog-eared book, from which the cover, as we quickly recall, was torn, in a physical contest of the master with one of the big boys, and turn the leaves traced with our frequent autograph, the pictures colored with poplar buds, or the anther of the lily, or, as we turn to the master's copy, from which we learned to write, we can more justly fill up the picture; and though we may smile at the awkward figures, with their grotesque surroundings, we can but feel that the childhood of to-day finds itself in the school-room upon a higher moral plane, and subjected to better methods and kindlier influences.

In judging of the moral character and influence of our schools, we are happily freed from the perplexing questions that divide the different schools of philosophy and embroil the metaphysician and the scientist. The cunningly devised theories of the origin of our ideas of right and wrong, — whether an original endowment or a gradual development, — we can safely leave to those who are preparing a system of ethics, or moral philosophy.

But it may not be amiss to remember that the original of the word "moral" indicates a custom, a habit, pointing us not so much to our philososphic belief, as to the conduct of life. And it is for us to inquire, not whether we teach our pupils the views of this or that school, but whether they do acquire a power of self-control, a command of their affections, passions, and desires, with the intent and will to direct them to worthy ends; whether, with a true and honest purpose, they go forth from our doors with a greater abhorrence of what is low and base, more faithful to the right, more sensitive to the breath of merited blame; whether, in regard for all that is ennobling, in courtesy to their equals, in respect for their superiors, they leave us better than they came, or rather, I would say, with a truer respect for the rights of all, even their inferiors. For to his superiors the boy, terrible as he is, is respectful, — not his superiors in position, in acquirements, in age, but in the essentials of true manhood or womanhood.

And the keen sagacity, the almost intuitive facility and accuracy with which a class of boys or girls will determine the quality and fix the position of a new teacher, might well put to the blush our examining committees and superintendents, with their nice balancings of merits and demerits, and summings of averages.

Nor are we to judge of our schools by now and then an exceptional case. "There is no flock, however watched and tended," of which we are always sure, though the committee of the National Association in July report no graduate of a high school yet found in jail.

The school is not the only force working within and upon the pupil during the school age. Even with the most punctual and regular in attendance, not more than a fourth of the waking hours are passed under the teacher's care. And who can tell the home influences of many of them, their associates upon the street, the exhalations from doorway, and basement, and window?

Faithful and efficient as the teacher may be, there are influences and examples stronger than his, and more constant and enduring.

"Let me make the ballads of a people," says some one; but with how much more truth might it be said, Give me the first six years, and send to what school you will. The question of submission or lawlessness, of truthfulness or falsehood, of deceit or honesty, is decided, we believe, for most children, before they are supposed capable of understanding it.

Not from the school, but in the home, do children learn their first lesson. In their own neighborhoods are they taught to look for wealth without work, for profit without capital, and honors without honesty. Teach contentment and industry to the toiler and the needy, with the palace home, or storied warehouse of their mates rising before their gaze, the fruit of some bold venture or fortunate speculation? Not till disappointment has deadened hope, and suffering numbed ambition, will they accept the lesson.

Nowhere, as in the well-directed school, is the spirit developed that regards character above surroundings, where merit is rewarded with success, and honor bestowed where it is due; and never, we believe, have our schools had a healthier influence, never made more earnest and successful endeavor for uprightness of purpose, or been surrounded or pervaded by a purer or more life-giving atmosphere.

In their very constitution are found the most efficient means for inducing a well-ordered life. If order is heaven's first law, it must be the first and abiding rule of the school; not that fixed and monotonous routine enforced by the mere martinet in discipline, that deadens the vital force, stifles thought, quenches generous ambition, and, regarding more the outward form than the inner life, aims only at uniformity, though only of dulness and stupidity, but that quiet, unconscious harmony that results from each member moving undisturbed in his proper sphere, in willing conformity to an unfelt but all-controlling power; no rules for the sake of ruling, no friction or jarring of ill-adjusted parts, none of the pomp and circumstance of military display, but all moving on to the attainment of a desirable end.

We may all recall such instances, as far removed from the hushed stillness and bated breath of the one extreme, as from the restless, noisy turbulence of the other, — an order which of itself is "able almost to change the stamp of nature," and is no insignificant factor in forming the character of a peaceful, law-abiding citizen.

But the most harmonious order, pleasing though it be, is of itself but a passive, fruitless, virtue, — but the casket whose golden ornaments and satin lining furnish no sufficient reason for its being, till the jewels are placed within, — but the well-founded structure, where the whirring wheels of a busy industry are still to be put in motion.

And from the initiation of the inchoate man or woman of presumably six years into all the mysterious possibilities of slate and pencil, through the little round of prerequisites for a high-school diploma, the pupils of a wisely planned school are learning lessons of patient, persevering industry. Despite the idle charges often made, it is not from our school-rooms that the lounging squads of the saloons are recruited, or the street-corners replenished. A search for the graduates of our high and grammar schools would lead us through the stores, the workshops, the counting-rooms, and the public or private offices of our city, — to the records of Boards of Education, or into many a cultivated, happy home. And in this day of invention who can blame them, if, instead of finding our sons delving in the dirt amid the horny-handed laborers, we see them, with upright form and comely attire, with steam and electricity to do their bidding, guiding and controlling a broader industry, and higher interests?

If a habit of intelligent and productive industry be not the parent of moral virtues, it is, at least, their foster-mother, and most approved nurse.

And surely it cannot be that the intellectual culture of the school, small and imperfect as it is, the history of the past, the rise and fall of individuals and nations, with the open or more hidden causes, the unbarring the gates of science and pointing them to the boundless and rich fields beyond, the unsealing of the wisest thought and the truest sentiment of the deepest thinkers and divinest poets of the ages, — it surely cannot be that all this is devoid of meaning for the moralist. We sometimes tire of listening to the dangers of intellectual, without moral education. The performing horse and trained dog may, perhaps, feel no special stirring of their moral nature, but we are not made up of two so distinct natures, that, farther apart than the Siamese twins, the one can be wrought upon, and the other feel no sympathetic throb. The child may, indeed, be taught to lie and steal, but that is not what we mean by mental discipline and intellectual culture. It is rather a maiming and torturing of the spirit. As well might we call the foot-bandaging of the Chinese an athletic exercise, and Simeon Stylites a gymnast; yes, and the warped and shrunken starveling, or the phenomenal and gormandizing Tanner, a professor of gastronomy.

No; the order, the industry, and the culture of our schools, though indirect, and often unconscious, are yet efficient and ever-present moral influences, which we cannot well overestimate.

Nor is the school wanting in that more direct and positive teaching and guidance that promote and establish a well-ordered life and character; not always or most frequently given in the set phrase of formal discourse and threadbare homily. It was not by permission, but by an undoubted inspiration, that Paul spoke the "foolishness of preaching." Though made the means of "saving those that believe," the trouble is that the school-boy does not believe, — in preaching, or in the teacher that preaches.

Well do I recall one such in my school life, who set apart his regular half-hour for so-called moral instruction; and if there was a half-hour in the day in which he wasted words, squandered the esteem, forfeited the respect, and lost the control of his pupils, it was that same moral half-hour. It was the appointed time for restlessness, inattention, and disorder, when the exhausted patience of his hearers found relief in whispered, if not in muttered complaint, from which a wiser man might have learned that it is not all of morals to moralize.

Noble as are the unquestioned motives of those who would introduce a text-book of morals for a half-hour of each day, we can but feel that, beneath the tender memories of their young days, a closer search would somewhere reveal an hour made irksome and unprofitable by that bane of a bright boy's life, — a moral lecture.

The good old days of our fathers and mothers, when the pastor appropriated the last half-day of each week to instruction in the catechism, was not far back of the time of Deacon Giles's famous distillery; and when the practice passed away, it was no exception to the law of the survival of the fittest. And even in the reading of the Scripture it is by no means certain that within the solemn covers may not lie concealed a leaf of Cæsar or Legendre.

The trouble with the dishonest and the vicious is not so often their ignorance of the true and the right, as their failure, through neglect or evil example, to have formed those habits of thought and action which constitute a well-ordered, a self-controlled, a moral character and life.

That we have attained the limit of moral excellence, or are doing all that can be expected, we do not believe, and certainly do not hope. It has been said that, when any work is completed, all real interest begins to abate. It is only in the progress, the pursuit, that the earnest zeal, the ardor, the deep interest is aroused and held fast.

But it is not to the stated lecture, or the carefully devised manual, that we would most securely trust for improvement. Our memory and experience point rather to the quiet suggestion, the fitly chosen word, the interested inquiry, the look, the unfeigned sympathy, the favored opportunity, the firm but calm decision of the loved and loving teacher.

First, and best of all, would we look to the personal character and example of the true, the large-hearted, right-minded man or woman.

Perhaps I cannot better express my thought than as I have elsewhere written, of this personal influence, which is the test and the crowning excellence of the true teacher, — an influence unseen, perhaps, and unobtrusive, but all-pervading; free from the slightest taint of distrust or suspicion, but checking insubordination before the thought of it has taken form; exacting a faithful performance of duties, yet encouraging by its inspiration before despondency has attained a conscious existence; soft and gentle as a mother's hand on the brow of a sick child, yet holding the reins of authority, and controlling the very motives of action, like the hand of fate.

For the due and full exertion of this influence we need to realize that, as teachers, we are engaged in the formation and development of character, into the warp or woof of which all the habits thoughtlessly formed, the modes of feeling, the pupils' deportment towards their teachers or towards each other, the kindly way or the uncouth manner, the listlessness or attention, the polite address or the unseemly reply, are all daily and hourly inwrought in permanent outline and unfading colors.

As compared with the life-giving, soul-saving influence of such a teacher, what were the dull routine of a daily half-hour of blundering monotony over the cold and dismal abstractions of some closet-conned and primer-planned system of morals?

Bishop Huntington, at last summer's Commencement, spoke, with eloquent words of censure, of parents consulting the wishes of their children, whose wishes and choice they should themselves control; but such a personal influence as I have indicated, like the breath of heaven, penetrates the soft texture of the child's nature, quickening and shaping the very promptings of desire.

We can conceive no more sacred duty, or one which, with an eye to the public weal, should be performed with more wisdom and care, free from bias or prejudice, than that of choosing the teachers of our public schools. Suitable means and appliances are desirable; books for study and reference, worthy of our most intelligent regard; but we may safely leave all this to chance, or the whim of the hour, if sure in the choice of the intelligent, cultivated, and worthy teacher, of generous, sympathizing character, as essential to the mental and moral growth of his pupils, as is good light and pure air to their bodily health. What a parody on the highest of callings, the reasons daily urged for engaging in it! A sick husband, brother, or child; my mother a widow; my wages insufficient; have been unfortunate in business; I should be benefited by a change; want an opportunity to review my studies; need rest before engaging in my profession; think I should like Chicago, — in all the endless variety into which these types may be developed.

Thankful may we be that from the ranks of the weary, the needy, the changeling, the improvident, the unfortunate, so few of the unworthy have found a refuge in our school-rooms.

In the management and discipline of the school, notwithstanding the doubts and forebodings of individuals, and notwithstanding the example and protests of our wise Eastern brethren, we believe that the prohibition of corporal punishment is a real forward step in the moral training of our schools. It may be questioned whether such chastisement is ever inflicted by the thoughtful teacher, or parent, without an after-sentiment of regret or shame, from the feeling that, after all, it was but a victory of brute force, simply because he was the stronger, and must have ended in the same way even if the child had been in the right. "Do you know why I whip you?" asked a fond father of his little son. "Yes, sir, because you are the biggest." And not unfrequently there is a rude awakening, on one or both sides, of the mere animal nature, insensible alike to the claims of right or reason. But cut off from this ready resort, the difficulty of the situation often necessitates a timely delay and a more careful examination, a study of the child's character and needs, resulting in a calmer and juster decision and treatment, and certainly leaves the teacher less open to the suspicion of angry or revengeful motives. A suggestion need not always be given in the form of a reproof, and in cases of deserved censure it will be found, in most instances, more wholesome if administered in private. A spirited boy of ten or fifteeen, called up for rebuke in the presence of his mates, all watching with eager interest, and to whose opinion of his brave and manly bearing he is keenly alive, and the same boy listening to the quiet, earnest, and kindly words of his teacher, with none of his companions near, or knowing of the interview, are two very different characters, in whose judgment the rôle of the teacher, too, is greatly changed. What in the one case was the harsh, unfeeling censor, to whom concession savored of cowardice, is, in the other, the feeling and judicious friend.

Nor is it always the pupil most familiar with the rules of kindness and courtesy at home who most readily responds to the voice of reason. And among the sweetest, the most genuine pleasures of these later years, I count the thanks, sometimes mingled with regrets, of the troublous, bothersome boys of old.

And of the eight or ten whom I would recall as the phenomenally bad boys of school, I do not know of one who is not to-day a useful and respected citizen, though some of them drew upon our stock of patience and forbearance to the very verge of bankruptcy.

There are those, I am aware, to whom all this is a dead language; who, at the suggestion of kindness, understand weakness, and for politeness imagine only a sickly sentimentality, ever ready with the reply that they could be easy, as well as any one, in not correcting faults, or insisting upon good lessons, their very excuses showing an utter want of apprehension of what is intended. I would abate no jot of any healthful requirement, but only ask for a prompter, because a willing obedience; and more thorough preparation, because a work of the heart as well as the head.

A command may be in order in the prison or the barracks, but in the school, as in the family, never, except as a kind of punishment. At the stern order to "take my hand out of my pocket," what a strange yearning ran tingling down to the very ends of my fingers, till the blood seemed to settle under the nails, — an inextinguishable yearning for the bottom of that pocket.

You have no time, you say, amid the press of school duties, to waste on mere forms of polite phraseology? What! no time to be a lady or a gentleman? Then you have no place in the teacher's chair, whose occupant should never be aught else.

And when all efforts prove futile, and the benefit to the pupil becomes hopelessly incommensurate with the harm his presence brings upon the school, let him be becomingly remitted to the care of his legal and responsible guardian, to whose natural or parental instincts we may assume, as the law has done, the charge may be more safely confided. In the school-room, and within his own domain, the teacher stands in his own right, and will wisely omit those functions, which only, as installed in *loco parentis*, he is allowed to exercise.

I am aware of the heresy, to some minds, of these views, but am trying to present what seems to me the only true basis for the teacher's authority, — that his powers inhere of right in his office, whatever dicta to the contrary may be burrowed from among the dusty decisions of forgotten judges. We need not that any *parentis locus* should be assigned us by the hocus-pocus of legal or judicial legerdemain, nor would we extend the limits of our domain beyond their natural bounds. We believe that school grounds are defined, as any other grounds, by their legal boundaries, and that if the unruly urchin break his neighbor's windows, or pilfer his peanut-stand, on the way to or from school, the sufferer should look to the parent for redress; and that in case of accident or harm, the parent, and not the teacher, should employ the physician and pay the nurse. But we also believe that whatever exerts a baneful influence upon the school, or serves to bring it into disrepute, whether done within the precincts of the school yard, upon the neighbor's grounds, "or in the continuous woods where rolls the Oregon," comes under the legitimate cognizance of the teacher, who, in the jealous care of his charge, may counsel, censure, or condemn.

But why the school grounds should extend to the father's door, rather than the home circle expand to the school entrance, is to us a mystery.

The parent is charged with the duty of providing clothing, food, shelter, and home-training, and is responsible to society for any neglect; and under a like responsibility is the teacher charged with his mental and moral training at school. The duties and the rights of the one, within his province, are as sacred and original, we apprehend, as the other.

What is to be gained by this assumption of another's part, which, by the way, is never urged, as we remember, except as involving the right to maul, maim, or mangle, — a right that teachers or parents desirous of exercising it should be left to maintain with their best blows upon each other, with the children behind to prick and goad them on.

As to the proper treatment of specific cases, and, in truth, as to general management and instruction, there is no rigid, unvarying method suited to all individuals, or to the same individual at all times. But for those fitted by culture, character, and disposition to be teachers, within certain limits, on which all thoughtful experience agrees, their usefulness is largely increased by a large infusion of their own personality; and, we fancy the weightiest charge that can be brought against normal schools is, that their pupils are so often charged and overcharged with the idea that theirs is the way, and the only way, and hence their unwillingness to adapt themselves to their situation and surroundings, impervious to the advice and counsels of their associates or superiors.

But, if there be one thing never to be lost sight of, it is that somehow the children should be interested in their work. The only point that Col. Parker insists upon, and the one that makes the thought of school a delight to every parent's heart, is that the school shall be made pleasant to the children; that they may no longer "creep like snail unwillingly to school," but that the subjects shall be so vivified, and so presented, that a necessary absence shall be a day of pleasure lost. Many a boy has doubtless been made a worthless, if not a dangerous, member of society by the irksomeness of his school days.

It is not alone by enforced restraint that these little bundles of activities are to be brought into relations of harmony and usefulness. Not more eager for what is new were Paul's hearers on Mars Hill, than they. Of quick discernment, of keen insight, and small respect for sham and pretence, they have not learned, as we, by long pupilage, to sit contented with teachings they do not understand, or to keep step to music not in unison with their young heart-beats.

Along the paths of learning, as well as in the world's highway, they do not follow kindly the straight and beaten track, but soon pull away from the hand that leads them, now picking berries by the roadside, now in the field with hat in hand, in full chase of some bright butterfly, and again bending down to paddle in the pebbly brook; and he is the wiser guide who, yielding somewhat to their wild humors, brings them in at the end, weary, it may be, but with many a little lesson learned, and childish treasure garnered.

Kindly and wisely to gather up these wild and changing humors, and without subduing the spirit, or abating the ardor, to unite them in one grand earnest purpose of life, is not the work of a novice, or a trained dullard.

Too often, I fear, we send forth even our best pupils with no aim beyond the diploma, no ambition but for the high mark, who, when the pressure of the class-room is lifted, float aimlessly out of the sparkling current of progress, like the bits of driftwood that we see on the scum-covered pool below the busy mill of our New England streams.

We, too, as teachers, need to keep ourselves in line and sympathy with the world's advance, and not, like Hamlet, with the ghost of some dead past forever rising before us, permit it to chill our warm impulse, and hold us back from all worthy endeavor and achievement.

We, too, need to join our strength and share our counsels with those of our own calling. We need to preserve so much of youth in our hearts as to find beauty and music in the floating butterfly, and the babbling brook of boyhood.

There are leaders and teachers among us, whose spoken or written thought we may not ignore. There is, too, the poetry, the science, the philosophy, the art, the history, the romance of our own and other days around us, that we may not neglect. And it may well be matter of astonishment how few are the fruits and flowers, from any of these sources, that may not be put to use in our daily work, in suggestion, in striking example, in apt illustration, in encouragement, in instruction.

And some such allurement is ofttimes required to draw us out of ourselves, to relieve that depression and weariness, that sinking of heart, that sometimes come on us, when the day's work is over, and we feel exhausted of our electric force by five hours' contact with threescore bristling fragments of humanity.

When all else fails, and "this whole round world seems flat, stale and unprofitable," as a sure and safe resource there is nothing for health, strength, and recreation, like a good reliable hobby. Though it be nothing rarer or more costly than moth hunting, the jingle, or jangle of rhymes, or even reformed spelling, they are, some of them, as I well know, of boundless possibilities.

But at your daily mount of your hobby-horse, take not your way down the crowded street, and through the thronging mart, nor over the choice flower-beds and fragrant exotics of your friends; but rather turn aside into the quiet lane, or the unfrequented country road, or, still better, off for a free stretch over the wide, open prairie, where, with tossing arms and expanding chest, you can shout forth your happiness, till with loud, answering echo, the solitary places shall be made glad with your presence.

Still onward till your beast and yourself are weary, and returning, see that he is well groomed and stalled, and in due time properly fed, in preparation for another day, and it may be the coming age will raise to you and it a monument.

We conclude, then, that leaving to the philosopher the abstruse questions of thought, and without trenching upon the beliefs or prejudices of any respectable portion of society, we have in our public schools the most certain and most efficient agencies for the moral culture of the young: the habit of quiet order, the diligent industry, the systematic method, and above all, or rather the pledge and security for all, the generous, the disciplined, the cultured, the ever-progressive teacher, one whom we would gladly receive into our homes as companions, and as guides and guardians of our children.

In the mutual rights and duties of the family and social relations, the rights of the child, we believe, are paramount. If the parent or the State has a claim upon the child for devotion and service, much more has the child, as the involuntary partner, a moral right to be educated for these relations. And with the truer aims and better methods of to-day, may we not fairly hope for an ever-increasing recognition and fuller satisfaction of this, his supreme right?

OVER A NEW ROAD.

BY ANNA C. BRACKETT.

In considering the question of the head of a college for girls or young women, many elements which should enter into the discussion are often, in the popular mind, altogether omitted. It is thought sufficient, if the candidate be shown to have passed through his own college course successfully, to have had some experience in literary or professional work since that time, to have sustained an irreproachable moral character, to possess executive and diplomatic talent in some degree, and, too often, that he be a member in full standing of some special distinct body of Christian believers. This last is to be regretted, because, where the choice between a number of otherwise fit candidates is narrowed by a special demand as to religious belief, it is often very much narrowed in the present time, when the number of first-class educators is embarrassingly small.

Let us suppose, however, that all these conditions are satisfactorily met; now this man we propose to place in the position of highest authority and influence over the minds of say three to four hundred girls and young women, at one of the most susceptible times of a woman's very susceptible life. These girls are isolated from the tempering and quieting influences of the world almost as much as if they were in a convent. They are removed from the society of fathers, brothers, and male friends, and are almost constantly in that of girls of their own age, or of older women, who, from the same cause, are themselves under equally abnormal conditions of life. The larger number of teachers and professors will naturally be women, and the, perhaps, half a dozen members of the Faculty who are men are so far removed from the familiar society of the students that their pupils see none of their foibles and weaknesses.

There is, generally speaking, no being more generously willing to admire than the young girl, full of enthusiasm, full of earnestness, with all her life full of promise, but only of promise, just opening before her. She is prone, to a dangerous degree, to hero-worship; and even when she is in the balanced society of the world, this tendency sometimes leads her into follies and extravagances which have something so morbid in them as to be rather sad than ridiculous. As an extreme case, witness the erection of a sort of altar to a favorite actor not many years ago in a New York home. The aforesaid altar was decorated, adorned with photographs of the actor in different characters, and with a candle kept burning upon it. This was an extreme case, but will serve to manifest the dangerous tendency of which we spoke. But in "narrowing nunnery walls" this danger is increased a hundred-fold, till an outsider is astonished, amused, and disgusted to see the admiration in which a very ordinary man professor in some one of these colleges is held by his girl pupils. Ordinary in appearance, in manner and intellectual abilities, he moves the centre of an admiring throng, who eagerly drink in his commonplaces, laugh at his cheap jokes, and suffer all the time, in so doing, a loss of their own native dignity and perception.

The tendency of any conventual life is narrowing, and towards all the excesses of a convent. The ecstasies of St. Catherine, or the raptures of St. Francis, have in them nothing elevating. They are the fruit of emotion allowed to transgress the bounds of reason; and the human being self-abandoned to his emotions, of whatever kind, is less than human. The religious feeling which can utter itself in such poetry as the following, is not healthful either to mind or body. It is by a celebrated nun, and to the Saviour: —

> "Say to my Master
> That here I lie
> The thing of his pleasure;
> His slave am I."

And although such utterances are given us as from an inspired saint, they betoken to our cooler judgment a totally depraved and perverted emotional nature.

This is an extreme; but many of our hymns in common use will bear witness how very narrow is the line which separates the utterance of intense earnestness of emotion, even when it be religious, from erotic poetry.

If a man is to have the misfortune to be placed in such an atmosphere, if he is to direct and sway, as the president unquestionably must direct and sway, the mental current of a whole institution, if he is to be made a hero of, as he in all probability will be, is it not at once evident that to fill the requisitions of so very anomalous a post he must be not at all an ordinary man?

He must be not only exact, unselfish, true, but he must be magnanimous and noble, with broad and catholic sympathies, and yet so full of well-earned self-respect as to be utterly incapable of vanity.

And the difficulty of finding a man to combine these almost opposite qualities would seem to be almost insuperable. If he be true and sincere, but cold, and too far removed by age or temperament from the warm sympathies of the minds with which he is to deal, his better qualities will hardly touch them. They will respect him with a kind of formal respect, but he will speak to them as from out of another and a foreign sphere. His chapel prayers will be a dead letter to them, and his influence, only restrictive, will be of no lasting power on those minds, so impressionable, so ready to be informed then as never afterwards, with a principle of life and growth.

He should be a creator, like any great artist, and he is none. The college life leaves no enduring stamp. He does conscientiously and faithfully all that he can do, but the all is not enough.

This is a misfortune. If, now, on the other hand, we have in that all-important place a man in whom the qualities before wanting preponderate, we have a worse danger. If we have a man whom, for want of a better term, we characterize as "magnetic," — a man of strong sympathies, quick emotions, and lively imagination, — we are incurring a danger the magnitude of which can hardly be overestimated. Between the two we stand disheartened, and ask, What is to be done? Are there no more Dr. Arnolds?

It seems sometimes as if the only solution would be to place, if she can be found, some strong, noble woman at the head of such an institution. If the woman could be found wise enough to assume the responsibility, however, she would shrink from the place, for none knows better than she the terrible drain upon the very springs of life which it would involve.

So to impress herself upon that army of girls as to create in them a spirit which should go on working in them as leaven through all their lives, would be, indeed, to sacrifice her own life. None but a woman of immense physical power could undertake the work, as none but a woman of the strongest emotional force, combined with the wisest and most ripened judgment, is equal to it. If this combination could be found, it would make a life in any college that would last in its impulse long after its inspirer was dead.

But as when, in an algebraic solution, we arrive at a negative result, we conclude, and not unjustly, that the conditions of the problem were irrational, may not, after all, the trouble which we find in the solution of ours arise from the same fact? Is it not, after all, an irrational thing to do to seclude four hundred girls from general society, with its levelling, depolarizing influences, and then demand that we shall find a man or a woman who is capable of doing for them what ought to be done, under such abnormal conditions?

And now, after our long and devious route in our honest effort by discussion to arrive at some solution of a vexed problem, what is that which we perceive before us as we turn the last corner, but the much-vexed theory of coeducation? Is not that the result at which we have come, by a circuitous and untravelled road, perhaps, but none the less surely there, with no intention on our own part, and quite as much to our own surprise as to that of our readers?

Our reasoning has been rather after the manner of induction than of deduction. We have made no postulate which we were to try to establish. We have simply allowed ourselves to be led along by the natural drift of the question, and have endeavored to speak the truth, the whole truth, and nothing but the truth.

This paper can in no sense be stamped as intentionally an argument for coeducation in colleges. It is simply a study. Its object was to formulate, in some clear way, the character of the man who was the proper person for the presidency of a girls' college. But, after stating the requisites, we found them with difficulty to be combined in any one man; at any rate, the number of men combining them would certainly never be large enough to furnish presidents for all the girls' colleges.

We then inquired whether the requisite qualifications, without the dangers, might not be found by appointing as president a woman instead of a man. But here other difficulties presented themselves, all these difficulties arising from the fact that the college in question was to be composed of girls.

Failing, then, to obtain a solution to our inquiry under these conditions, we not unnaturally concluded that the conditions were unreasonable, and that, instead of trying to decide on the qualifications for the presiding officer of our girls' college, it would be wiser to make it a college for both sexes. As soon as it should be made this, all the conditions which rendered our selection of a suitable president so difficult would be changed, and no problems would remain. In a college for both sexes, the harmful and dangerous tension which we have indicated as existing, to a greater or less degree, in all institutions where girls, separated from the general current of society are placed together, would not exist. It would be harmlessly dissipated under the more natural conditions, and thus the mind would be freed for nobler and more strengthening work.

AN EXPERIMENT IN READING GREEK AT SIGHT WITH VOLUNTEER CLASSES IN COLLEGE.

BY A. C. MERRIAM, PH. D., COLUMBIA COLLEGE, NEW YORK.

NUMEROUS are the methods of teaching Greek, and each has its partisans to press its claims with more or less zeal. The following account of an experiment carried on for the last three years is presented, not because it is unique in itself, though something new to the writer at its inception, but because the details may prove of interest, if not of service, to educators: —

The Class of 1881 of Columbia College was observed to be so much interested in reading the Odyssey, as Freshmen, that a favorable opportunity seemed to be presented for putting to the test several questions of a practical bearing; whether, for instance, there was any inclination among the students toward a wider study of Greek than the prescribed course of three hours a week, and if so, how great; what would be the effect of reading extensively, mainly for the translation, as compared with the painstaking work done in class, or as superadded to it; how great a facility in reading Homer could be acquired in this way by the end of the collegiate year, etc. In Columbia College the exercises were then all completed at one o'clock, and the students departed to their homes till the following day. Accordingly, the announcement was made to the class that if some half-dozen or more would volunteer for the reading of Homer from one to two in the afternoon twice a week, the experiment should be tried. On their part they were to undertake to do what their time would permit toward making out the translation of one hundred lines for each reading, but the instructor expected to act the part not only of commentator, but also, in a degree, of a dictionary. The class assembled for the first reading directly after the Christmas holidays, with twenty-four members from the Freshman Class, and five from the Sophomore. Twelve of this number withdrew within the first four weeks, for various reasons. The average attendance of the remaining seventeen to the end of the collegiate year was sixty-one per cent. The plan pursued in the work was to give each student a short passage to translate, and this was then carefully rendered by the instructor and commented on. The translations made by the class were found to be much better than was expected or contemplated; in fact, they were almost as good as the regular class recitations, and some who withdrew towards the close of the year advanced the reason that they could not continue to devote the time to it which such careful work required, and their scholarly pride would not suffer them to make an insufficient preparation. The great majority, however, were unflagging in their zeal, and for the last month or more, at their own option and suggestion, the readings were increased to one hundred and tweny-five lines at each sitting. The entire amount read was some 3,250 lines. On the last day of meeting, the test of reading at sight was applied, and the result showed that such proficiency had been acquired that any part of the Odyssey could be read with considerable fluency. In addition to this, their regular work in class appeared to be strengthened, and to be given a wider grasp, as would be naturally expected.

Such were the results of the first and tentative period, answering the questions which the enterprise was originated to solve with such good promise, that its continuance for another year seemed to be demanded, in order to determine what could be done with the same students, beginning upon the foundation which they had now acquired, and reaching out into less familiar and more difficult fields.

In consequence, the class was formed on the 1st of November of the following year, and was composed of fifteen Sophomores and Juniors, mainly those who had pursued the course during the preceding year. It was believed that now, with the vocabularies which they had acquired, and the experience which they had had, the work could be made one purely of reading at sight. The result justified the belief. An especial request was made that no preparation be undertaken beforehand, not only that the experiment of reading at sight might be tested, but that the feeling so prevalent that a Greek sentence is a fortress to be stormed only when the student is arrayed in all the panoply of lexicon, commentary, and grammar, might gradually wear away and disappear. The meaning of unfamiliar words was not given them outright, but they were traced back to their roots, which, in general, the student was familiar with, and then by the application of the rules for suffixes the sense would be evolved along such connecting links as would bring into play the laws of growth in language, and leave the word connected in the mind with some idea already there, and so more securely domiciled for future use. In this way the class was able to read the first book of the Cyropædeia and a part of the second, the Clouds of Aristophanes, all of Anacreon and the Anacreontics, and extracts from Alcman, Arion, Sappho, Alcæus, Stesichorus, Ibycus, and Simonides of Ceos.

For obvious reasons it seemed quite inexpedient to join with this advanced class such of the incoming Freshmen as desired to pursue this course; a separate class was therefore formed early in December, composed entirely of Freshmen, and the same system as before in reading the Odyssey was pursued, previous preparation being required, and manfully performed, through the year, by ten members who devoted themselves to the task. Toward the close of the season, however, it became mainly a reading at sight, and one hundred and seventy-five to two hundred lines would be sometimes accomplished in the hour. Altogether, 4,000 lines of the Odyssey were read.

During the collegiate year just closed,* the undertaking was carried on with larger classes and a better average attendance. Both classes were started at the opening of exercises in October. The advanced class was composed of Seniors, Juniors, and Sophomores. The Egyptian History of Herodotus was read, and a practical acquaintance was formed with more than forty of the famous poets of the Gnomic and Lyric Schools, such as Callinus, Tyrtæus, Mimnermus, Solon, Phocylides, Pseudophocylidea, Xenophanes, Theognis, Archilochus, Simonides of Amorgus, Hipponax, Babrius, Terpander, Alcman, Sappho, Erinna, Alcæus, Anacreon, the Anacreontics, etc. All this was read at sight upon the same plan as before.

The class just entered was requested to prepare its one hundred lines of the Odyssey, but it was made a point now to finish that in time to devote one quarter of the hour to reading beyond the limit prescribed, so as to become accustomed to the work without preparation. This produced results so satisfactory that, when half the year was past, it was deemed expedient to drop preparation altogether, a course justified by the success attending it. This class read twelve and a half books of the Odyssey, — about 6,000 lines all told.

On the last days of April an examination of both classes was held in writing, to determine definitely in that way the facility they had acquired in reading without any assistance the authors upon which they had been engaged. Writing was limited to one hour, and the amount to be translated was so selected that it could be fairly done within that time, without opportunity for much puzzling over knotty phrases. The passages were taken from the authors read, but not from the parts read, the advanced class being examined upon Herodotus I. 36, Theognis 743–752, and the thirty-third Anacreontic; the other, on Odyssey I. 345–359, IV. 696–710, and IX. 360–370. The papers handed in were examined and marked with the strictness of an ordinary class-examination, upon a basis of one hundred maximum, with results varying from ninety-eight to eighty in the advanced class, and from ninety-six to seventy-four in the other. On the whole, the sense of the passages was fairly given, the main difficulty arising from ignorance of single words, which were either new, or were confounded with others quite similar in form, this confusion of words being quite noticeable and curious, but chiefly in the first year's class.

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* June, 1880.

This experience and this practical exhibit have quite converted me to the belief that "reading at sight," in Greek that is not over difficult and abstract, is feasible, and in fact is actually attained by the methods here described. They will scarcely make one capable of reading with fluency the Odes of Pindar, the Agamemnon of Æschylus, the Œdipus Tyrannus of Sophocles, the Periclean speeches of Thucydides, or Demosthenes De Corona; but a royal demesne of the most delightful Greek literature flings its doors wide to the student, courting his entrance, and welcoming him when he comes to a seat at a hospitable board, instead of presenting that forbidding aspect and those formidable battlements commonly imagined, which must needs be stormed and taken at the point of the sword if approached at all. A taste for the literature is thus created as the difficulties vanish, marauding expeditions may gradually be made into the closed precincts, and finally, when the student graduates, he may carry with him a continual refutation of that question which we hear on all sides, so benumbing because so often all too true, "What is the use of studying Greek, when the college graduate, after six or seven years' work upon it, cannot take up a Greek text he may not have previously read, and turn it into English?"

Within a few days past my attention has been called, by a distinguished gentleman whose interest is unceasing in all that may tend toward making our college work more effective, to the words of President Porter relative to this subject in his "American Colleges and the American Public," which I had never had the good fortune to see before. There I found advocated for adoption in regular class work, after the Freshman year, quite the same methods that I had been practising with my volunteer classes, and I cannot do better than to close by quoting some of his words which my experience proves both wise and practicable. After sounding the warning that we are as much in danger of "too high grammar" in our teaching as the English are of "too high verse-making," he says: —

"We would propose that the following experiment should be fairly tried. Let the time of short lessons and of special analysis terminate with the Freshman year, or a little later. For the remainder of the course let the lessons be very long in comparatively easy Greek authors. . . . Let the attention be directed to the import of the matter, to the logical connections and transitions of the thoughts, to the peculiarities of diction, and to a constant praxis in felicitous and idiomatic English rendering. . . . Let reading by phrase and by the eye, without reconstructing the words after the English order, be recommended and enforced. . . . Let an intellectual spirit, and an æsthetic feeling for the peculiarities in thought and diction of the author read, be earnestly fostered. . . . Our interest in the matter arises from our desire that a new enthusiasm may be kindled in classical studies. We are especially desirous that the taste for Greek literature, and the interest in the Greek language, should be fostered in the colleges of the country, as one of the essential conditions of a generous and refined culture. The Latin language is so much more thoroughly mastered as less to need fostering care."

Such words, from such a source, lend an additional interest to my independent experiment, and serve strongly to reinforce its lessons.

OBJECT-TEACHING: ITS PURPOSE AND PROVINCE.

BY N. A. CALKINS.

BACON first proclaimed that philosophy which afterwards became the corner-stone of object-teaching, in his "Novum Organum": "Man, being the servant and interpreter of nature, can do and understand so much, and so much only, as he has observed, in fact or in thought, of the course of nature; beyond this he neither knows anything, nor can do anything."

In his endeavors to direct the attention of teachers to the world around, he urged them to "turn away from the broken cisterns of traditional science, and quaff the pure waters that flow sparkling and fresh, forever, from the unfathomable fountain of creation." He bade them "go to Nature, listen to her many voices, consider her ways, and learn her doings." He told them that "men read in books what is said concerning stones, plants, animals, and the like, but to inspect these with their own eyes is far enough from their thoughts." He thus pointed them to the better way: "We should fix the eyes of the mind upon the things themselves, and thereby form a true conception of them. It is none the less true in this human kingdom of knowledge, than in God's kingdom of heaven, that no man shall enter into it except he become first as a little child."

Bacon was a philosopher, and looked on the work of education from the side of nature. He saw clearly that real knowledge must be built up from an observation of things. Although the thoughts which he uttered produced no decided changes in the methods of education during his lifetime, their influence has been strongly felt through all subsequent generations.

Comenius, who was over thirty years old when Bacon died, acknowledged the influence of his philosophy. He became both a celebrated teacher and philosopher, and applied the principles of Bacon to education. He published his "Orbis Sensualium Pictus" in 1657, and therein laid a foundation for object-teaching more than a hundred years before Pestalozzi was known. An examination of some of his statements relating to elementary education will show that he builded wisely and firmly; and, at the same time, these will aid in unfolding the purpose of this system of education: —

"Instruction will succeed if the method follows the course of nature. It must begin with actual inspection, not with verbal description of things. What is actually seen remains faster in the memory than description a hundred times repeated.

"The first education should be of the perceptions, then of the memory, then of the understanding, then of the judgment. The schools are wrong in first teaching languages, and then proceeding to things. Things and words should be studied together, but things especially, — the object both of the understanding and of language.

"Hitherto the schools have done nothing with the view of developing children like young trees, from the growing impulse of their own roots, but have been engaged in hanging them over with twigs broken off elsewhere. They teach youth to adorn themselves with others' feathers, like the crow in the fable. They do not show them things as they are, but tell them only what others have thought and written about them.

"In God are the ideas, — the original types which He impresses upon things; things impress their representatives upon the senses; the senses impart them to the mind, the mind to the tongue, and the tongue to the ears of others. *The mind thinks; the tongue speaks; the hand makes;* hence we have sciences of things, and acts of speaking and working. To learn is to *proceed from something known to the knowledge of something unknown.* To know is to be able to represent a thing, either by the mind, or the hand, or the tongue.

"During the first six years the foundation should be laid for all that children are to learn during their lives. In physics, they should begin to know stones, plants, animals, etc., and the names and uses of the members of their own body. In optics, to distinguish light and darkness, and colors. In geometry, they should begin with ideas of shape, length, breadth, lines, squares, circles, solids, etc. In arithmetic, with counting. In geography, with the knowledge of the room, the house, the streets, the fields, the farm, their neighbors. In history, with what happened to-day, yesterday, the day before, last week, last year. In chronology, they should obtain a knowledge of day and night, hours, weeks, months, seasons, years, festivals, etc. In astronomy, they should learn to know the sun, moon, stars, and that the moon is sometimes round and sometimes sickle-shaped. In language, they should commence with the pronunciation of words, with talking, reading, and writing.

"The school is a manufactory of humanity; it ought to work its subjects into the right and skilful use of their observing powers, their reason, speech, and talents for occupation; into wisdom, eloquence, skill, and readiness.

"Learning is by steps, from the easy to the difficult; from the simple to the compound; from the nearer to the more distant; from the regular to the anomalous. *It is good to use several senses in the understanding of one thing.* The attention should be fixed upon only one object at a time, and upon the whole first, and the parts afterwards. The subject to be apprehended must be made clear, and presented in an orderly manner. The faculty to be directed to it must be calm. Retaining will be made easier by repetition; and recollecting by means of the relations of things, and by proper associations of them. Rules should not be given before examples. Artisans understand this well, that doing can only be learned by doing."

Rousseau, who lived about a hundred years after Comenius, obtained great insight into child nature, and became an earnest advocate of the development of the minds of children by the exercise of their senses through attention to objects. He was an educational reformer rather than a teacher; and his theory of education exerted great influence upon the mind of Pestalozzi, who subsequently applied its principles to a series of object-lessons.

Nearly a hundred and fifty years after Comenius had become a practical educator, and while his published works on education were popular, Pestalozzi, at the age of fifty-two years, — and after many failures in other occupations, — began his real work of teaching. His school was composed of orphans, and other poor children; and the numbers attending became so great that he found much difficulty in arresting their attention. As a means of overcoming this, he introduced object-lessons to gain their attention through their senses. At first his methods were very crude; but through his own experience, and by the aid of teachers who were subsequently associated with him, more systematic methods were introduced. Pestalozzi was more successful in directing attention to better principles for guiding teachers to the discovery of good methods for instruction than in devising them himself. He became distinguished as an educator more through that which he stimulated others to accomplish, than by what he did through his own method of teaching. It does not appear that he had brought his methods of teaching into harmony with his own theory of education. He was guided in his work by his great humanity for children, and his convictions as to the importance of training their minds in habits of observation, and their characters in the ways of right acting.

Pestalozzi did not claim that he invented a new system of education for children, but that he had "lighted upon truths little noticed before, and principles which, though almost generally acknowledged, were seldom carried out in practice." He found teachers pursuing the most mechanical modes in their school exercises, notwithstanding the principles which direct to better methods were known to many. He endeavored to point out ways of teaching in harmony with the child's nature, and to lead to the acquisition of knowledge by the pupil's own experience.

His most celebrated works were "Lienhard and Gertrude," written when he was thirty-four years of age; and "How Gertrude teaches Her Children," written when he was fifty-five years of age. Through the influence of these, and his school at Yverdun, which was his most successful one, he attracted the attention of distinguished teachers, who took up his principles and applied them to elementary education throughout Germany, Austria, and Switzerland.

Froebel successfully applied the principles of developing all the powers of the child — physical, mental, moral, and social — by means of systematic exercises adapted to each. He took children before they were old enough to attend to the ordinary studies of school, and trained them under circumstances most favorable to good results, and thus prepared them for school-life and work.

Object-teaching occupies an important position in the elementary schools of several countries of Europe, and also in the schools of many cities and towns in the United States and in Canada. It is making good progress in the schools of the Argentine Republic, and of Chili, and other parts of South America, through the use of works on this system of teaching which have been translated and published in the Spanish language. Its principles and methods are embraced in the course of instruction for training teachers in Cape Colony, Africa.

Many teachers use methods which they call object-teaching, that have neither the spirit nor the real form of this system. Others follow some of its principles, but do not employ enough of its methods to render their instruction systematic. With some of its disciples the aim has been chiefly to furnish exercises for the development of the senses, but without systematic connection in the matter of the instruction. With others, it may be said the chief purpose has been to provide better illustration and instruction of the facts pertaining to the subject of the lesson.

True object-teaching embraces both of these aims; and the greatest need with the teachers of to-day is a better understanding of the real principles of this system, and a thorough acquaintance with proper methods for applying them.

ITS PURPOSE.

For the further explanation of the principles of object-teaching, and its real import and purpose, let us consider what it is claimed to be and do.

Object-teaching has for its purpose a thorough development of all the child's faculties, and their proper employment in the acquisition of knowledge, instead of the plan too commonly pursued of depending upon the memory for this purpose. It is not a plan of fixed, unchangeable methods, but a system of training based upon and controlled by the fact that the beginnings of real knowledge must come through the appropriate exercise of the senses. Its purpose is not the attainment of facts, nor the cultivation of language as an end; but the development, to a vigorous and healthy action, of the child's powers of getting and using knowledge, both by the methods of obtaining it and by the knowledge itself. It furnishes exercises to produce ability to learn, and methods to aid in the learning.

It does not signify the things about which something is taught, nor that which is taught about them, so much as it does the principles by which the teaching is performed, and the purpose and manner of the teaching. It deals with things, and it considers subjects also. It attends to realities and their relations, rather than to ideals and their representations. It furnishes a means of attaining clear and intelligent ideas of distant objects and events through those that are near and known.

Object-teaching prepares the learner's mind by development begun through sense-perceptions, and continued by observation and reflection, to understand clearly the important facts concerning things and acts, and their relations to spoken and written language. It does not propose, however, that the child shall gain all its knowledge by the long process by which the human race was led through the wilderness of personal experiences to the attainment of the present sciences; but it does propose to lead the young, inexperienced learner into the midst of objects and influences that will awaken the several senses to activity. And, as their activity develops knowledge, even though elementary in form and nature, the learner will thereby become able to profit by the greater experiences of others, and thus increase his progress in knowledge. It proposes to guide the young learner till his own enlarged experiences prepare him to extend his acquisitions through the experiences of others, as they are furnished by means of books; and also to confirm the facts thus gained, by his own observations.

Once more, object-teaching implies, —

First. — The use of systematic exercises with objects for the development of the power of gaining the elements of knowledge.

Second. — A training in habits of getting knowledge from objects, models, pictures, and diagrams, by careful observation; both of these ends being reached through the guided personal experiences of the learner.

Third. — Teaching the pupils how to avail themselves of facts previously discovered by others, and recorded in books; and training them to verify those facts, so far as practicable, by personal examination.

Prof. S. S. Greene, in "A Report on Object-Teaching, before the National Teachers' Association," 1865, happily indicates its purpose as he describes what it is: —

"Object-teaching is that which takes into account the whole realm of nature and art, so far as the child has examined it, and assumes as known only what the child knows, and works from the well known to the obscurely known, and so onward and upward till the learner can enter the fields of science, or of abstract thought. . . . It is that which insists upon something besides mere empty, verbal expressions in every school exercise; in other words, it insists upon expression and thought, in place of expression and no thought. It is that which makes the school a place where the child comes in contact with *realities*, just such as appeal to his common-sense when he roams at pleasure in the fields. It is that which relieves the child's school task by making it intelligent and possible. It bids him examine for himself, discriminate for himself, and express for himself, while the teacher stands to give hints and suggestions, not to relieve the labor. In short it is that which addresses itself directly to the eye, external or internal; which summons to its aid things present or things absent, things past or things to come, and bids them yield the lessons which they infold, which deals with actual existence, and not with empty dreams."

ITS PROVINCE.

In describing the province of object-teaching, which has already been foreshadowed, I shall consider it in *three stages*, so that its relations to school instruction may be clearly seen.

First Stage. — The province of the first stage of object-teaching is chiefly occupied with the development of the child's perceptive powers through proper exercise of his several senses. At this period it does not propose to engage in teaching objects, nor subjects, but rather in the use of a systematic plan by which objects shall become the means of awakening the child's slumbering energies, of developing their activity, and thus opening wide the gateways to his mind.

This work should be commenced by the mother before the child is old enough to enter school, with supplying suitable objects to induce the proper exercise of each of the senses, and a training in the use of these materials in such a way as to lead to noticing their easily perceived properties. The desire for knowledge which the child expresses by those familiar and oft-repeated questions, — "What is it?" — "What is it for?" — "Why does it do so?" — should be carefully heeded, and the child led through his own experience, as far as practicable, to find answers to his questions. It is what the child is taught to do that educates him. Kindergarten training belongs to this stage of object-teaching. And where children enter school without having received any systematic training for the development of their senses, this stage of the work should be employed during the first term of school attendance, in the lowest primary class, as a means for preparing the young pupils for subsequent instruction.

Second Stage. — The province of the second stage of object-teaching is to prepare the young pupils for taking the elementary steps in learning the simple facts of those subjects which are included in the course of instruction for the first two years at school. During this stage objects are employed both as a means of development and as subjects of instruction, through the child's personal experience. The teacher provides suitable materials, and stimulates and guides the pupils to such attention to them as will secure that mental activity and habit of careful observation necessary to develop properly the powers of the mind, and to gain real knowledge, and cultivate the right use of language.

Third Stage. — The province of the third stage of object-teaching is the acquisition of knowledge from objects, and the proper association of facts with their appropriate subjects. The teacher chooses the object, or subject, leads the pupils to group around it the known facts which relate to it, and guides them in the way of learning more concerning it. Facts acquired and associated become knowledge. Methods of teaching produce habits of learning that greatly influence all the pupil's subsequent attainments of knowledge. It is the province of object-teaching to give special attention to those modes of instruction which will lead to a *right manner of learning.* During this stage of teaching, the use of objects, the use of the child's remembered experiences, and the observations of others, which can be learned from books, are all combined for supplying the pupil with complete knowledge of the subject, thus leading to classification and science.

Herbert Spencer indicates its appropriate province, in his "Education," where he says: "Object-lessons should be extended to a range of things far wider than now. They should include those of the fields and the hedges, the quarry and the sea-shore. They should not cease with early childhood, but should be so kept up during youth as insensibly to merge into the investigations of the naturalist and the man of science. Here we have but to follow Nature's leadings. Where can be seen an intenser delight than that of children picking up new flowers, and watching new insects, or hoarding pebbles and shells? And who is there but perceives that by sympathizing with them they may be led on to any extent of inquiry into the qualities and structures of these things? Every botanist who has had children with him in the woods and the lanes must have noticed how eagerly they joined in his pursuits, how keenly they searched out plants for him, how intently they watched whilst he examined them, how they overwhelmed him with questions. The consistent follower of Bacon, the 'servant and interpreter of Nature,' will see that we ought modestly to adopt the course of culture thus indicated."

LEARNING OR TRAINING: WHICH?

BY ALBERT PRESCOTT MARBLE.

In calling attention to the defects of the school system, some of our critics seem to be confused as to the aim of schools. There have been common schools in this country, of one sort or another, for nearly two hundred and fifty years. With the varying conditions of society, modifications in the system have been needed from time to time, and changes have been made. The schools are not by any means perfect; they must be adapted to the times; but they must not be overthrown. And through all the changes, the fundamental idea must be preserved. It is worth while to inquire whether the schools may not be reformed to death; whether the tendencies of certain of our revolutionists are not destructive of that which should be the purpose of public school education.

When our forefathers first settled this continent, they fled from the tyranny of a government founded on the idea that power was conferred upon the rulers by the grace of God. The government which they founded later has for its central idea, that power is derived from the consent of the governed. As long as the country was new and sparsely settled, this fundamental idea had its full realization. But when Boston becomes a metropolis, with a quarter of a million inhabitants, the application of the idea has to be modified a little. In the time of Gen. Gage the boys, we are told, played on the Frog Pond on the Common, and they brooked no restraint in their play. Now, policemen guard that little lake and the well-kept lawn, and the boys are restrained. Numerous restrictions have become necessary in the great city, and in the country around, compelled by the denser population, and the consequent changed conditions. We have gravitated towards some of the restraints from which our fathers fled.

But the fundamental idea still underlies our government. The stern necessities of civil war have centralized and consolidated the governing power; but through it all, the origin of the power is still with the people.

Popular education was provided for at an early day. It has, all along, been enforced by legislation as a necessary part of our form of government; and, like that, all its further modifications must preserve the fundamental idea, the preparation of American youth for citizenship and intelligent participation in the conduct of public affairs. Led by men eminent for their name or their well-known ability in one direction or another, there is something of a clamor against the public schools. The methods of those schools are attacked. The results are belittled. What remedy do these revolutionists propose? What have they ever done to improve the deplorable state of things which they think they see? Generally nothing whatever. Dogs in the manger, they do nothing but try to impede those who, with all the skill they can command, have been trying and are trying to conduct and to improve the education of American youth.

John Milton said, in the preface to his book, "Let him that finds fault produce a better." Let the zealous maligners of public schools show us a better way, and prove that it is better. This is just what we want. But have they, the new lights, proceeded far in the demonstration in those localities which have been placed in their control? Is it yet certain that "Jack the Giant-Killer" and "Jack and the Bean-Stalk" are altogether better than the "New England Primer"? I do not say they are not. It takes time to find out.

The most furious attacks upon the public schools do not always proceed from bottom facts. One of the most encouraging signs of the times is that such a paragraph as the following appears in a leading daily newspaper in the city of Boston: — *

"Mr. Richard G. White's success in calling public attention to some of the mistakes and lacks in our public school system has apparently raised a little bump in the 'ego' centre of his usually level head. He is speaking for himself, or for his own man of straw, when he gives the reason of the advocates of public schools for their maintenance, in the plea that 'society owes every child an education.' That is not the bottom idea, Mr. White, though it is n't a bad one for a republican State that calls itself civilized, not to say Christianized. The real position is, that society owes it to *itself* to educate the children who are in the future to constitute the State and society. On the low ground of self-protection society can make no better or more needed investment. And to ask, 'why is it that society owes every child an education any more than it owes him or her a pleasant home and good clothes,' is no more conclusive than it would be to demand why it is that society owes every man legal protection in his personal and property rights, any more than it owes him a mounted body-guard or a nice block of government bonds. The schoolmaster is as much a part of the equipment of a well-ordered State as a policeman or a judge. Mr. White may never have had occasion to invoke the services of the police or the courts, and yet he pays taxes — we trust uncomplainingly — to support them. Society does not, perhaps, owe very much to Mr. White as an individual, or care very much about him; but, as a member of the State, it looks after him, whether he owns anything to pay taxes on or not. The Republic is so far removed from barbarism on the one side, and a government of the many by the few and for the few on the other, that it does not say to its members, 'Every man for himself and the devil take the hindmost; let those who can, or who choose, educate their children and the rest go untaught.' Mr. White ought to know that to destroy is not the sole end of criticism."

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* See "Herald" of Oct. 13, 1880.

The attacks upon the schools are, as a rule, vague and general. They consist of mere assertion. When Mr. White says "the schools not only do not prepare youth for American citizenship, but they positively unfit them for the duties of life," I may get up and say that the schools do prepare American youth for citizenship, and they do not unfit them for the duties of life. At this point the argument has not advanced a step. Mr. White makes an assertion, and I make a counter-assertion. Mr. White is an eminent writer, but as he confesses, I believe, he is not familiar with schools. I am not an eminent writer, but I have seen a good many public schools. When Mr. White will curb his Pegasus, and bring himself down to one little fact, then it will be time enough to see about that little fact. Mere generalities, when put in forcible language, such as this class of writers use, are quite entertaining to read; but they are not argument, and they do not much move the American people. One thing these malcontents have proposed, and it is to speak of this that I drop for a moment my busy work in the schools of a growing city. They howl against technical grammar; they raise a cry against geography; they decry arithmetic; they are especially furious against what they call "dry routine," and "drill"; they call the teaching mechanical, and speak of the "company-front" plan in education. To say all in one word, they call the public school system "the machine." On the same principle, the little boy said to his brother who had been worsted in a quarrel with another boy, "Call him names, Jim."

In place of this disagreeable study, our critics propose the oral method. The teacher should "make it interesting," and so forth, and so forth.

Now, poor teaching there is; and poor teaching is bad. Unintelligent study there is; and this is bad. Let us try to correct all that. It is the constant effort of teachers, and all who are at work in the interest of schools, to correct it. A good deal has been done in this direction. A good deal more is being done, even though Mr.

Charles Francis Adams, Jr., will not allow any school superintendent to call himself a reformer,* and the Boston school committee want to do, as some one says, — though I don't believe it, — just what the masters do not want.

But for poor teaching shall we substitute diffusive, everlasting talk? For study, sometimes irrational, shall we ordain no study? Can children be fitted for citizenship without effort on their part? Has anybody who amounts to anything — have even our eminent critics themselves — been developed on the taffy plan? If I mistake not, the substitute proposed for the work in our schools tends very largely to nambypambyism. If, for study and intelligent work in school, we introduce a passive entertainment, — and this is what much of the talk tends to, — the future citizens will be a very helpless set, without nerve or muscle; cowardly and effeminate.

The new lights that sweep across the educational field are brilliant and striking. Like comets, they spread over the firmament. By their novelty they almost conceal the stars. They are the wonder of the time. In the minds of some, they inspire a kind of superstitious awe. But the scientific investigator is not alarmed. They have no disk. Close inspection shows them to be composed of thin vapor. Their diffusive lustre photographs no permanent image on the youthful mind, and they disappear with the day. Little stars are not striking, but they stay; and you know where to find them.

The aim of school is training; it is not mere acquisition of facts. Right training requires work, and a few things, well hammered in, points like stars, not diffusive lectures like comets' tails very broad and very thin. In this training even technical grammar and the old courses of study are not wholly nonsensical. They may not be the best, but they are better than the nothings that must take their place if they are abolished without a substitute. For training — culture — it is doubtful whether there is so much that is new. And it is certain that the whole field of knowledge cannot be covered in the public schools. Says a writer in the "Contemporary Review," August, 1880, "The true purpose of the school is not to anticipate the lessons of life, but so to discipline the mind that it may be prepared to learn them from experience. . . . Our incessant experiments in educational reform serve only to interrupt the traditions, and therefore to lessen the prestige of our culture; they perplex teachers, scholars, and parents alike; they lead to doubt and hesitancy, and must all end in a simple return to the old system." The question is whether there is not something for Americans to think of in this view.

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* See Chautauqua speech, July, 1880.

THE RENASCENCE AND ITS INFLUENCE ON EDUCATION.

REV. R. H. QUICK, A. M.

II.

IN the last number, I endeavored to set forth some of the evils which have descended to us from the educational ideal of the Renascence. We saw that when the school course was settled, the only notion conceived of the educated man was the classical scholar. From this it followed that the highest distinction was awarded to the student of other men's words and other men's thoughts, so that doing and thinking came to be considered of far less importance in education than learning and remembering. Again, the adoption of a literary ideal caused an exaggerated importance to be attributed to literature, and made books the sole apparatus of instruction; and at the same time, by a singular anomaly, it banished literature proper from the school-room, and sought to confine the learners' attention to the phraseology and the idioms of two dead languages.

There is yet another weakness about the Renascence ideal,—a weakness from which most ideals are free.

Most ideals have this merit, at least, that he who makes even a feeble and abortive effort to reach them is benefited in proportion to his advance, however small that advance may be. If he fails to seize the coat of gold, he carries away, as the proverb tells us, at least one of the sleeves; or, to use George Herbert's metaphor,—

"... Who aimeth at the sky,
Shoots higher far than he who means a tree."

But the learned ideal has not even this advantage. The first stage, the study of the ancient languages, is so totally different from the study of the ancient literatures to which it is the preliminary, that the student who never goes beyond this first stage either gets no benefit at all, or a benefit which is not of the kind intended. Suppose I am within a walk, though a long one, of the British Museum, and, hearing of some valuable books in the library, which I can see nowhere else, I set off to consult them. In this case it makes no difference to me how valuable the books are if I do not get as far as the Museum.* My friends may comfort me with the assurance that the walk must have done me good. Perhaps so; but I left home to get a knowledge of certain books, not to exercise my legs. Had exercise been my object, I should probably have chosen another direction.

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*This illustration was suggested by a similar one in Prof. J. R. Seeley's essay on the teaching of English in his lectures and essays, 1870.

Now schoolmasters, since the Renascence, have been in the habit of leading all their pupils through the back slums of the Seven Dials and Soho, in the direction of the Museum, with the avowed purpose of taking them to the library, although they knew full well that not one pupil in ten, not one in fifty, would ever reach the door. To produce a few scholars able to appreciate the classics of Greece and Rome, they have sacrificed everybody else; and, according to their own showing, they have condemned a large portion of the richer classes, nearly all the middle classes, and quite all the poorer classes to remain "uneducated." And, according to the theory of the school-room, one half of the human race — the women — has not been supposed to need "education." For them "accomplishments" have been held sufficient.

In conclusion, I must point out one effect of the Renascence ideal which seems to me no less mischievous than those I have already mentioned. The ideal led the schoolmasters to attach little importance to the education of *children*. Directly their pupils were old enough for Latin grammar the schoolmasters were quite at home; but till then the children's time seemed to them of small value, and they neither knew, nor cared to know, how to employ it. If the little ones could learn by heart forms of words which would afterwards "come in useful," the schoolmasters were ready to assist such learning by ready application of the rod, but no other learning seemed worthy even of a caning. Absorbed in the world of books they overlooked the world of nature.

Galileo complains that he could not induce them to look through his telescope, for they held that truth could be arrived at only by comparison of MSS. No wonder, then, that they had so little sympathy with children, and did not know how to teach them. It is by slow degrees that we are breaking away from the bad tradition then established, are getting to understand children, and with such leaders as Rousseau, Pestalozzi, and Froebel, are investigating the best education for them. We no longer think of them as immature men and women, but see that each stage has its own completeness, and that there is a perfection in childhood which must precede the perfection of manhood just as truly as the flower goes before the fruit. "Childhood," says Rousseau, "has its own ways of seeing, feeling, thinking"; and it is by studying these that we find out how children should be educated. Now our connection with the world of nature seems much closer in our early years than ever afterwards. The child's mind seems drawn out to its surroundings. He is intensely interested in the new world in which he finds himself, and whilst so many of us grown people need a flapper, like the sages of Laputa, to call our attention from our own thoughts to anything that meets the eye or ear, the child sees and hears everything, and everything seen or heard becomes associated in his mind not so much with thought as with feeling. Hence it is that we, most of us, look back wistfully to our early days, and confess sorrowfully that though "years" may have brought "the philosophic mind,"

> " . . . Nothing can bring back the hour
> Of splendor in the grass, of glory in the flower."

The material world, then, seems to supply just those objects, whether birds, beasts, or flowers, by which the child is attracted, and on which his faculties will therefore be most naturally and healthily employed. But the Renascence schoolmasters had little notion of this. If you think the greatest scholar is the greatest man, you will, as a matter of course, place at the other end of the scale those who are not scholars at all. An English inspector, who, no doubt, thought children had been created with due regard to the revised code of the Privy Council, spoke of the infants who could not be classed by their performances in "the three R's," as "the fag end of the school"; and no doubt the Renascence schoolmasters considered children the fag end of humanity. The great scholars were, indeed, far above the race of pedants; but the schoolmasters who adopted their ideal were not; and what is a pedant? "A man who has got rid of his brains to make room for his learning."* The pedantic schoolmasters of the Renascence wished the mind of the pupil to be cleared of everything else, that it might have room for the languages of Greece and Rome. But what if the mind failed to take in its destined freight? In that case the schoolmasters had nothing else for it, and were content that it should go empty.

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* Miss J. D. Potter, in "Journal of Education." London, June, 1879.

THE RELATION OF NORMAL-SCHOOL WORK TO THE STATE.

BY S. N. FELLOWS, D D.

DR. MARK HOPKINS says that "government has no right *to be* except as it is necessary to secure the ends of the individual in his social capacity, and it must therefore be bound *so to be* as to secure these ends in the best manner. . . . To obviate practical difficulties, however, it must be observed that when it is said that government is for the individual, it is not meant that it is for one individual especially, but for *all* the individuals of whom society is composed."

Among the objects of the government as set forth in the preamble of the United States Constitution, are these: "to provide for the public defence," and "promote the general welfare."

It is a principle universally recognized in every department of government, that the right to attain and secure any great national interest or end, implies the right to construct and use every legitimate and necessary means for attaining that end. It is as a necessary means to an end that the right to educate pertains to the State. If education is the best and "cheapest defence of nations," then the nation should educate for the same reason that it establishes military and naval academies, builds ships, ports, arsenals, and prepares the munitions of war. If it can be shown, as it can be, and has been done, that the education of the people is necessary to the "general welfare," and that it is unsafe to leave this education to private enterprise, it becomes not only the right but the duty of the State to educate the people.

But the State is bound also to secure its ends in the best manner and at the least expense. It is of the highest interest to the farmer to have his land tilled and cultivated after the best and most scientific methods, otherwise loss, and even financial ruin may follow. The manufacturer who studies his truest and best good, employs only skilled labor, in order to avoid waste and secure the best results. It is of far greater importance to the State to have its seven millions of children, — the most precious jewels of the nation, — during the six years of their average school-life, receive their instruction and training from skilled teachers; otherwise, blunted intellects, warped characters, and wasted lives may be the terrible national result. The duty of the State then "to provide for the public defence and promote the general welfare" implies the duty to educate the people.

The duty of the State to educate the people *in the best manner*, implies the duty to provide trained teachers to whom the work of education may be intrusted.

The extent to which the State should educate is determined by its own needs and ability. If it is necessary for the "general welfare" that all the people should have an elementary education, provision for a universal elementary education should be made. If the "general welfare" demands that a portion of the youth should possess, and all should have the privilege of acquiring such mental and moral discipline as only a university education can secure, provision should be made for a university. State education of every degree and kind can be maintained only as a sound public policy.

The provision for teacher training should be commensurate with the wants of the schools of the State. If the State should provide and maintain primary, grammar, high schools, and the university, it follows necessarily that schools should be established for the instruction and training of teachers for all these grades, and if these cannot be secured by private enterprise, the duty to establish and maintain them devolves upon the State.

The right and duty of the State to make necessary provision for the education and training of the teachers in all grades of schools being proved, the practical question arises, how can this be done in the best manner, and at the least expense? Let it be remembered that we have a system of schools so organized and adjusted that pupils may enter the primary, and pass step by step through the grammar and high school and university. This system, in order to be complete, and carried forward to its highest efficiency, and thus truly "promote the general welfare," needs to be supplemented with facilities for teacher training.

Where should this work begin? I answer, *in the universities.* Who are the pioneers of progress in every department of life? They are those in the highest circles of thought and investigation. All reforms in art, literature, science, law, politics, and religion have their origin in the minds of a few, who, with clearer and broader vision, stand on higher heights, and scan a wider horizon. Thence the reform, the new truth in discovery, passes down to those on lesser heights, until it reaches the masses in the valleys below. It is in this way that "the philosophy of one generation becomes the common-sense of the next." The same principle governs in national education. All reforms in school work or teacher training should begin in the highest institutions of the land. *The foundations should be laid here.*

It is related in the history of Poland, that many years ago it was a Protestant country. In an evil hour a Jesuit minister of public instruction was appointed. This to a casual observer would seem to be an unimportant fact. This minister of public instruction soon secured, by his own appointment, Jesuit professors in the national university. In a few years, Jesuit graduates of the university were sent out as teachers into the academies and secondary schools. These in turn supplied the primary schools with Jesuit teachers, and Poland passed under the control of Roman Catholicism. Whether the above be fact or fiction, it illustrates the point.

Suppose that instead of organizing the first elementary normal school in the United States in 1839, Yale and Harvard Colleges had established chairs of didactics, and that other colleges had followed their example, who can estimate the results that would have followed? This recognition of the need and value of teacher training by the chief institutions of learning would have started an influence that would have been felt in every school-room and home in the land. The science and art of education would have been far more rapidly developed. The courses of study and methods of teaching in the colleges themselves would have been greatly improved. The graduates of these colleges who have become teachers, principals, and superintendents of schools would have entered upon their work, not only disciplined, educated in the truest sense of that word, but also with a clear understanding of the principles and methods of education, familiar with its history and progress, and also with the philosophy of teaching. With superintendents and principals possessed of the zeal and enthusiasm born of such knowledge and skill, to organize and marshal the educational forces, stimulate the scholars, and inspire the subordinate teachers with a spirit of earnest work, it is difficult to overestimate the grand results that would have been accomplished in our graded schools. Besides, these schools would in turn have become training schools for teachers in grammar and primary grades, and so a mighty impetus would have been given all along the lines of our educational forces. The greatest need to-day, in educational as well as in other departments of industry, is *directive power.* This directive power implies a ground-work of general education that can be obtained *only* in the highest and best-equipped institutions. Let the State then provide in its universities for the best instruction and training possible in language, mathematics, and science, and supplement this in its chairs of didactics with needful professional instruction and training for those who become teachers, and the possible results described above will become realities in the near future.

Secondly, how can the State best provide for the training of teachers for grammar and primary grades? It is in connection with this grade of normal work that the question of separate schools arises. If it be claimed that culture, or the knowledge of subjects, or both, are legitimate branches of normal teaching, then it follows that the separate normal school involves a double system of secondary general instruction. The high school is universally recognized as the secondary school for general culture. It is the connecting link between the higher and primary schools, and binds all into unity and system, and is therefore regarded as a vital and necessary part of the whole. If normal schools are established on essentially the same basis and do the same work, the people fail to see the reason for their existence. Hence the criticism on normal schools.

It is believed, therefore, that normal schools should become more distinctively professional. To meet present necessities, it may be wise to maintain preparatory departments, in which all academic instruction shall be given. In the normal school itself, let the instruction, as near as possible, be wholly professional, including, of course, such reviews of branches as may be necessary for illustration of methods. Again, in order to secure a more hearty support of normal schools, the element of confidence or trust should be more fully introduced into their management. This is as essential in education as in business. In this age, when all nations interchange goods, compete in the same markets, and possess mutual commercial interests, it would be impossible, without the element of confidence, to carry on successfully any branch of trade or business. So in our complex educational affairs, as teachers we labor in different departments, or schools, and yet we have mutual interests, are working for a common end. We, too, interchange goods, compete in the same markets, and without the element of mutual confidence we cannot hope for the highest success. Students from accepted graded schools should be received, on certificate of scholarship in the required branches, into the normal schools for professional training alone. As normal schools become more and more distinctively professional, and draw students already prepared in scholarship from the graded schools around them, the reason for their separate existence will become more apparent, and they will receive a heartier support from the people and the State.

But the people will never incur the expense of a sufficient number of separate normal schools to meet our educational demands, and therefore some other provision must be made. It is believed that this can be best and most economically done by providing, as far as possible, for a normal school, or department, or teacher, or class, in connection with every high school in the State. If it be true that "graduates of well-organized high schools are likely to make the most successful teachers, and from this source our graded schools are destined to draw recruits to their teaching force," it would seem that to supplement the drill and culture of the high school with the professional training required would secure the best results and at the least expense to the State. And as these high schools are established in almost every county, it may be claimed that soon no further provision for teacher training need be made.

Another means of teacher training by the State is the institute. As a temporary expedieney, the teachers' institute is of great value. It serves to arouse public attention to the need of better methods in education. It reaches the great mass of teachers who intend to teach only a year or two, and causes even them to strive to render better service. It elevates the ideal of teaching, increases sympathy, and cultivates enthusiasm among all classes, and lays foundations for more thorough training in the future. It must be admitted, however, that it has been often perverted. So far as it is merely an opportunity for cramming for a subsequent examination, it is an educational fraud, — a fraud upon the teachers themselves, and upon the people, for it conduces neither to sound scholarship nor professional skill. In the present stage of advancement of teacher training, however, the institute cannot be dispensed with, and under such guidance as will guard against abuse, and carry it forward to its greatest efficiency, it should be vigorously supported by the State.

In conclusion, it is claimed that the State should provide for normal-school work commensurate with the wants of the schools of the State. That the provision should include : —

1. Chairs of education in universities.
2. A normal department in every high school.
3. Separate normal schools which shall be strictly professional.
4. Maintain temporarily, preparatory departments in normal schools and teachers' institutes. These, being temporary, should be dispensed with as soon as the educational facilities of the State will permit, leaving the first three mentioned above as the *permanent provision* of the State for teacher preparation.

In this way it is believed the State, in the matter of education, will promote the "general welfare" in the best manner and at the least expense.

EDUCATION.

No. 2. — NOVEMBER, 1880.

EDITORIAL.

Mr. Thomas Hughes's visits to America are always most welcome. The genial author of "Tom Brown at Rugby" and "Tom Brown at Oxford" is well and kindly known by all American students, while his efforts to improve the interests and condition of the working classes have rendered him popular among the middle and lower ranks of English-speaking people on both sides of the Atlantic. Mr. Hughes is really an international man, whose real home is in the hearty fellowship and esteem of both continents. His recent trip to America has an interest which connects itself with the labors of scholars and philanthropists, in the settlement of an English community in Central Tennessee, on some of the principles of a co-operative society.

About three years ago the attention of English capitalists, led by Thomas Hughes, Esq., had been directed to the Cumberland Plateau as a locality to which young Englishmen of wealth, who desired to follow agricultural pursuits, could emigrate. At about the same time, a company of Boston gentlemen formed what was known as the "Board of Aid to Land Ownership." As the result of conferences and negotiations between these English and American gentlemen, a union was formed in an incorporated company for the purpose of encouraging such immigration and settlement.

After six months' constant travel and investigation, the Board secured for its proposed settlement an area of land on the Cumberland Plateau of Northern Tennessee, about one hundred miles from Nashville and six or eight hours by rail from Cincinnati. The plateau has an elevation of two thousand feet above the sea and about one thousand feet above the general plane of the State. The soil is said to be good, easily tilled, and adapted to almost all agricultural products. The country is heavily wooded, and the grass is of luxuriant growth. The air is pure, and the temperature agreeable the year through. No malaria exists, and the climate is peculiarly favorable to the recuperation of consumptives. The lands have been surveyed; buildings are in process of erection, among which are a hotel, a school-house, and a church; and New Rugby has been set in operation by a company of young English gentlemen, with their wives and others, who have taken possession of their new home in Northeastern Tennessee, on the line of the Cincinnati Southern Railroad. The Board retains supervision over the whole territory in very many matters, similar to the practice in Vineland, N. J., and Greeley, Col.; to secure a community such as is desired, and to insure homes for a refined class of people, with moderate means.

The plan (as set forth by Mr. Hughes) is to aid colonists, by an advantageous purchase of land in large areas, and its sale in small parcels, at low prices, on credit mainly of years; by systematic plans of towns, streets. farms, and building restrictions, to the benefit of all; by an arrangement for reduced rates of transportation; construction of school-houses, and aid to churches; furnishing of steam or water power, portable mills, etc., as far as practicable; securing a population that will insure a good neighborhood; sale of seed, fuel, lumber, tools, etc., to colonists, at minimum cost; construction and ornamentation of roads; encouraging tree culture; prohibiting, in original deeds, manufacture of and traffic in intoxicating drinks; economizing fences; establishing barrel factories, and drying and canning establishments; employing an efficient superintendent, who shall teach the best methods of farming, etc.

The essential features of this movement are now so well established as sound, its success being made dependent only on the class of people who enter the scheme, that it is quite evident that Mr. Hughes will establish on this side of the Atlantic a fair memorial of his intelligent zeal in behalf of his countrymen.

PROSPERITY AND EDUCATION.

We have entered upon an era of solid prosperity. During a season of stagnation and enforced economy, this country has accumulated wealth to the extent of turning the credit balance of trade with foreign nations largely in our favor, bringing our bonds home to stay, and starting gold shipments towards our shores in a steady, shining stream. Never for fifty years, if indeed ever before in the history of this country, were gold, silver, and bank-notes equally acceptable to the people, because equally reliable as money. With gold coin, silver legal-tender, national-bank notes, greenbacks, silver certificates, and gold certificates equally available for currency, the demands of trade are not yet satisfied, and the call for fractional paper currency is urgent and well-grounded. At present, the capacity of our people to absorb currency is uncertain. Before the war we floated only $7 *per capita* in paper money, whereas now we have reached the figure of $14 *per capita*, and instead of a plethora the cry is still for more, until it seems not improbable that we may yet reach the average in France, where the paper circulation for every man, woman, and child is $44. The cause of the increased amount of paper money *per capita* is the greater confidence in the currency than that which prevailed during war times and the ante-bellum wild-cat banking period, when the disposition was not to hoard but to get rid of currency, which disposition, in the years subsequent to the war, led to the wild speculation to which the panic of 1873 gave an effectual quietus.

Glancing at the productive interests of the country, the picture is as cheerful as that presented by the monetary situation. A series of good seasons at home, synchronous with a series of unfavorable seasons abroad, has put our farmers on the high road of prosperity, and all other industries have caught the cheerful pitch and are chorusing in the harmony of abundant and profitable production. The manufactories and railroads are so alive with the impulse of business, that it is even proposed to re-erect the broken column of our shipping interests, that the cycle of production, enhancement, and delivery may be complete, and the entire profit on the commodity, from the moment it is taken from the soil or from under it, till the laying of it down in a foreign port, may redound to the benefit of our own people. Immigration is another source of wealth to this country, and at present the influx of immigrants is unprecedented. Population is a most valuable import. People not only extract wealth from the land in excess of what they consume, but also, by furnishing a market near at hand for the farmer's produce, enhance the value of his possessions, and by increasing the demand for building sites, cause the value of real estate in towns and cities and their vicinage to appreciate in a degree far beyond its value as a factor of natural production.

The development of the South is an element of wealth to the nation at large, which partisan feeling at present prevents many good people from discerning. But it is apparent that the era of ill feeling and mutual misunderstanding and misrepresentation is drawing to a close, and that the vast energies of that section, which were misdirected in slavery times, and have been allowed to lie dormant a good portion of the time since the war, will soon be called into full play for the development of the incalculable wealth that awaits the "open-sesame" signal of enterprise and labor. Immigration on this continent, as was the case in the eastern continent, after surging westward to the natural limits, will recoil on itself and flow southward in a living, wealth-giving, wealth-receiving tide. Small farming, diversified farm-products, mining, and manufacturing, with the inestimable adjuncts of commerce by rail and water way, will, at no late day, make the industrial condition of the South as rich as her soil and mineral deposits, and her social temperament as sunny as her sky. Area for area, sugar land is seven times as productive as wheat land, and the possibilities of a Southern farm would bewilder the brain of a Northern market-gardener. Cotton seed, once an incumbrance on the plantation, manufactured into oil, oil-cake, and paper, has become a perennial bonanza, and the rolls of cotton fabric yielded by the plant will have, in the future, to look to their laurels against the rivalry of the woollen goods that may be derived from the fleeces of sheep, feeding on and doubly enriching the fields in the intervals of cotton-growing.

But what has this to do with education? Education is at once the cause and the fruition of industrial prosperity. But it is not our purpose at present to dive into the deeper philosophy of this correlation. A few surface facts and practical suggestions are all we aim at. Let all who have the cause of education at heart bear in mind that material prosperity is not necessarily a factor of educational progress. In the impulse to make hay while the sun of prosperity is shining, there is danger that the rising generation, or a portion of it, may be deprived of the benefits of schooling, in order to supply a part of the demand for labor. It is not the very poor, but the penurious and covetous that keep their children out of school and at work. Money-getting is a disposition that is apt to be indulged in at the expense of principle and feeling, at the expense of future prospects and flesh and blood. The hopelessly poor, if not depraved, strive, in the wreck of their own lives, to float their children by giving them a good education. Times of intense industrial activity supply temptations to the young to engage in business, which are absent in periods of stagnation. Hence a panic is not an unmixed evil, inasmuch as, besides clearing the surcharged financial sky, it drives a whole generation of youth out of work and into the schools, — a class of youth who will always work when work is to be had. It is an error to suppose that hard times compel children to labor. The essence of hard times is the scarcity of work for the adult, and much more so for children. Hence, in the present prosperity, there lurks a danger to our special interest, which it would be well for social scientists to guard against by agitation and legislation, or at least by the enforcement of the laws already on the statute book.

This is not a time to rake up the industrial-education problem. The danger is that our youth will be tempted from the school to the work-shop. The work that children do in some places, such as picking slate out of coal in certain mines of Pennsylvania, is barbarous, and should be prohibited by law. No country or section of country is ever richer, in the long run, by yoking its children, its women, or its cows to hard labor. Such a course may be necessary in some countries; but here, where machinery is used to subdue nature, such a measure is not only cruel, but also bad economy. Children put out to work, and deprived of the mental cultivation that is due them, are not efficient agents of social well-being in after life, but rather stones in the field of industry, snags in the stream of progress. If any poor boy rises in position, it is because he will not stay where fate placed him, but is determined to do for himself what his parents ought to have done for him. Self-made men are such because, as boys, they followed the wise suggestion of Mahomet, and went to the school, inasmuch as the school will not come to them. In times of prosperity, let the old work, and the young study and play. A few years' study at the formative period of the mind raises the individual to a higher plane of activity, and puts the long arm of the lever in his hand through life. There is no great dearth of labor that is not speedily remedied by inventive genius. Invention is the favorite child of intelligence, whose fostering mother is the school.

In one particular the present prosperity brings peace. During the period of speculation, one evidence of confidence in the future was the building of expensive schools in various parts of the country. When the pinching of business depression was felt, it was found difficult to pay the interest on the bonds issued for the erection of these structures, to say nothing of the principal. Popular dissatisfaction at this condition took the form, under the guidance of demagogues, of opposition to public high schools, in cases where the economical pressure did not find sufficient vent in the reduction of teachers' salaries. With both high schools and teachers, in many places, it was a "struggle for existence," under circumstances more adverse than the inventor of that expression could have anticipated. The high schools in most cases survived; in many cases the teachers survived. The present prosperity should mean restored salaries to the teachers who suffered reduction during the period of depression. It is to be hoped, too, that the same prosperity means peace for the public high school. Its apparent expensiveness furnished a weapon of attack upon it to the hand of the open enemy, or the "fool friend" of the schools, during the bad times; but now that plenty prevails, if anybody raises hand or voice against the public high school, let him be *anathema.*

MISSIONARY EDUCATORS.

Two great missionary associations have just closed their annual sessions in America, both being held in New England, — *The American Board of Commissioners for Foreign Missions*, and *The American Missionary Association.* As organizations for the spread of religious truth these two bodies have a remarkable history, but their history as organizers of great educational movements is equally marked. The earlier policy of the American Board was to confine itself to the planting of mission stations, the translation of the Bible, and the preaching of the truths of the Christian faith; but the ever-opening door of civilization, as well as Christianity, has demanded the establishment of schools, colleges, and seminaries in all parts of what was recently styled heathendom. It may be of interest to note the growth and dimensions of the educational department of this great organization, as presented in the report of Dr. N. G. Clarke, the foreign secretary of the Board:

MISSIONS.

Number of missions	17
Number of stations	75
Number of out-stations	639

LABORERS EMPLOYED.

Number of ordained missionaries (seven being physicians)	156*	
Number of physicians not ordained	6	
Number of other male assistants	8	
Number of female assistants	246†	
Whole number of laborers sent from this country		416

* Including nine still supported at Sandwich Islands.
† Including eleven at the Sandwich Islands.

Number of native pastors	142	
Number of native preachers and catechists	425	
Number of native school-teachers	528	
Number of native helpers	174	
Whole number of laborers with missions		1,269
		1,685

THE PRESS.

Pages printed, as far as reported (Turkish, Japanese, North China, and Zulu missions only)	20,606,478

THE CHURCHES.

Number of churches	272
Number of church members, nearly as can be learned	17,165
Added during the year, nearly as can be learned, with additions not previously reported	2,485

EDUCATIONAL DEPARTMENT.

Number of training and theological schools and station classes	29	
Number of pupils in the above	1,051	
Number of boarding-schools for girls	37	
Number of pupils in the same	1,361	
Number of common schools	709	
Number of pupils in common schools	25.374	
Whole number of pupils		28,098

When the bill of particulars is read, from which the above statistics are compiled, it becomes one of the most luminous pages of modern history, and illustrates the wonder-working power of education vitalized by the great principles of Christianity, in which all Christian teachers and educators may rejoice. We cannot do better than to quote from Dr. Clarke's able and lucid report: —

"In Armenia, no efforts have been spared to bring the churches up to self-support and to self-government, and to secure to them such educational institutions as shall prepare an efficient body of educated Christian men and women to take up and carry forward the work of evangelization. This object alone justifies the large expenditure from the Otis bequest of over $50,000 the past year, on the colleges at Aintab and Harpoot, as grants in aid for raising up a native ministry, on the theological seminaries at Marash and Marsovan, and on high schools and seminaries at Erzeroom, Cæsarea, Van, and elsewhere.

"The greatest progress in the Turkish missions the past year is to be noted in the direction of education and of woman's work. No longer content with the elementary studies, there is a demand, as never before, for high schools, and a readiness to make generous efforts to secure them. The attendance of students in the colleges and in the seminaries is steadily increasing. The wise direction of this newly awakened intellectual life, that it be not secularized but imbued with the spirit of the gospel, imposes the gravest responsibilities on the missionaries.

"The newly awakened interest in education is bearing its richest fruit in the social and moral elevation of women. Graduates from the seminaries at Aintab, Harpoot, Cæsarea, Marsovan, and the Home at Constantinople are to be found teaching girls and women in their native villages, till the number of girls' schools has more than quadrupled during the last five years.

"In Western Turkey, the schools for Greek girls at Broosa and Manisa are well attended. Nearly half of the large church at Cæsarea is made up of Greeks, and Greek students are found in the theological seminary at Marsovan. At Constantinople, a large part of the time and strength of the missionaries is given to the production of a Christian literature for the whole empire.

"A graded system of schools has been introduced in Sivas, which has excited general admiration. Where less than $500 was given for education ten years ago, more than ten times that sum is now given, and the number of pupils has increased from five hundred to fifteen hundred in the public schools. In Tocat it is proposed to establish a high school, to be named after Henry Martyn, in honor of the noted missionary whose grave is in that city. No pains have been spared to provide the best opportunities for theological study at Marsovan. The men connected with the seminary are such as would do honor to similar institutions at home. Of the recent graduates from the mission seminary, four are already engaged as teachers in different places. The most hopeful feature of the work in some places is the school taught by a graduate from the seminary,—perhaps the wife of a native pastor.

"The most remarkable feature in the history of Cæsarea is the changed sentiment in regard to female education. The graduates from Miss Closson's school are eagerly sought as teachers, so that where not a single girls' school was to be found five years ago, sixteen are contemplated for the coming year. Indeed, there seems to be no limit to the opportunities of reaching the women and the girls in thousands of homes.

"In Ceylon almost the entire expense of the education of over seven thousand youths of both sexes is now met by the native population. In Japan, the training school at Kioto is doing most effective work, having an attendance of eighty-eight pupils. The English course, embracing the study of the classics, and such text-books as are usually taught in this country, has been extended to five years. Then follows a special theological course of two years, for such young men as are proposing to enter the ministry. To meet the pressing needs of preachers, a special course of Biblical instruction has been provided for such as cannot take a full course.

"The schools for girls at Kobe, Kioto, and Osaka have had over one hundred and twenty pupils, and the course of study includes many of the branches taught in high schools in this country, only giving more prominence to Bible studies.

"The mission has issued about two millions of pages of Christian literature during the year, including a religious newspaper, the only one of the kind in the empire. The event of the year, however, was the completion of the translation of the New Testament, in April last, on which Dr. Greene with others has been employed for the last six years."

EDUCATION IN PARIS.

PARIS, no doubt justly, boasts of being the most cosmopolitan city of Europe. The artist, the scholar, and the votary of pleasure alike find abundant scope for their pursuits. Two hundred years before the discovery of America, she was recognized as occupying an important position in the world of letters; and mediæval poems of the twelfth century treat of her traditional twelve men, who seem to bear some resemblance to the seven wise men of Greece. She was indeed, long ago, renowned for her university, to which flocked men of all nations, for the mysteries of her scholasticism, and the active enterprise of her commercial and industrial pursuits.

It should, however, be noted that Paris was a city where learning held high carnival and walked in the palaces of the great, rather than ministered to the wants of the people. Rapidly as has progressed the matter of primary education during the life of the present republic, there yet remains a wide field to be covered, before the primary schools of Paris can be compared to those of Boston.

It would seem that, during seven hundred years, greater attention has been paid to higher education than it has been thought worthy to bestow upon less distinguished branches. Therefore, we find among more than 20,000 educational institutions, only about five hundred devoted to primary instruction.

According to the "Liste des Establissements Scolaires communaux de la Ville de Paris, 1879," there are one hundred and forty-nine schools for boys, and one hundred and fifty-five for girls, — about one third of which are under the instruction of *congréganiste* brothers or sisters. There are seven special schools for boys. The total number of pupils is about 200,000, and the salary of teachers about two francs a day. Reading, writing, arithmetic, a little history and geography, and the catechism are taught. There are also fifty-eight classes for adult men and apprentices; thirty-nine classes of the same character for women. The pupils, numbering about 14,000, receive gratuitous instruction in reading, writing, arithmetic, grammar, drawing, geometry, and vocal music every evening from eight to ten.

There are one hundred and fourteen *salles d'asile*, or infant schools, for both sexes, in which are found daily about 15,000 children. The schools are adapted to the requirements of very young pupils, who are supposed to graduate at about the age at which children in America enter school, — namely, six years.

The schools of a higher grade are of two kinds, — classical and scientific, and industrial; these are called lyceums and colleges. The superior municipal schools are, College Chaptal, with about 1,300 pupils, who receive instruction at a cost of 200 francs each, or if boarders, 1,000 francs a year; College Turgot, of somewhat inferior instruction, and six hundred pupils; and Colleges Colbert, Lavoisier, and J. B. Say.

The College Rollin belongs to the city, and has forty professors and three hundred pupils.

The lyceums are exclusively classical or scientific, and comprise three divisions: 1, elementary; 2, grammar, for all under fifteen years of age; and 3, a superior division, in which are taught sciences and literature, Greek, Latin, English, German, philosophy, mathematics, history, chemistry, physics, and geography, with gymnastics and military drill. There are six of these lyceums, and together with that at Versailles, the pupils join in competitive trial for annual prizes.

There are private establishments, — too many to enumerate, — of much the same character. Prominent among them is College Stanislaus, with thirty professors and two hundred boarders; College Ste. Barbe, with one hundred professors, and 1,000 boarders and day scholars.

There is an *école supérieure du commerce*, in which pupils receive a practical commercial education; and a somewhat similar establishment under the superintendence of the Chamber of Commerce, in which the pupils number about four hundred. These are taken on excursions to large ports and foreign countries, and brought into practical contact with commercial interests and transactions.

There are two normal schools under municipal authority, one for training male teachers, the other for female teachers, conducted upon much the same plan as the American schools.

A superior normal school, intended for the education of young men fitting for professorships, has about eighty pupils, spacious cabinets, lecture-rooms, laboratory, and a library containing 20,000 volumes.

An *école d'apprentisage*, under municipal direction, is largely attended by young men preparing for trades; and the Central School of Arts and Manufactures, established on the old Polytechnique plan, attracts many young men who are intending to become civil engineers, builders, or directors of manufactories.

Most of these special schools are founded by government, and are under the various departments or governmental bureaus. The Polytechnique school, under the direction of the Minister of War, trains pupils for service in the artillery, the staff, mining and marine; bridges, highways, and telegraph; term of study, two years.

A school of civil engineering, under the authority of the Minister of Public Works, consists of about one hundred pupils, chosen from the Polytechnique, who receive instruction in whatever relates to the different branches of civil engineering. Foreigners are admitted to these lectures through their ambassadors. There is, in addition to the regular military school, a superior school, where pupils for staff service are received by competition.

A school of mines, under the Minister of Public Works, gives instruction in mineralogy, geology, mining, etc. During five months of the year gratuitous lectures are given in the other sciences. A large library is open to public use, except on Sunday.

A school of charts, at the Palace of the Archives of the Kingdom, is supplied with three professors and four assistants, who give daily lectures on paleography, political institutions, and diplomacy.

A school of Oriental living languages has eleven professors, who lecture publicly and gratuitously on vulgar Arabic, Persian, Turkish, Armenian, modern Japanese, Russian, Malay, and Javanese, while a practical school of high studies receives young men of decided talent for scientific research. This latter school is divided into four sections: 1, mathematics; 2, natural philosophy and chemistry; 3, natural history and physiology; and 4, history and philology.

The Conservatory of Arts and Sciences was intended for the technical education of manufacturers and mechanics. It has fourteen professorships, — geometry, agriculture, mechanics, economy, natural philosophy, legislation relating to manufactures, civil architecture, statistics, chemistry, drawing, ceramic arts, spinning, weaving, dyeing and printing textile fabrics. All lectures are gratuitous. In addition, it has a museum of models of all industrial machines, and a library of 20,000 volumes. It occupies the church and buildings of an ancient abbey, some ruins of which have a great historical interest.

The Conservatory of Music and Lyrical Declamation enables young people of both sexes to receive gratuitous instruction from the best teachers of the world. Pupils enter from all nations and enjoy equal advantages. At present they number about 600. A grand prize enables the successful competitor to study two years in Rome, at the expense of the state. A library of 8,000 volumes is attached to the establishment. In the museum of musical instruments are the flute of Frederick II. of Prussia, a harp of the time of Louis XVI., which has the name of the Princess Lamballe inside of it, and a harpsichord belonging to Marie Antoinette. The library has a collection of English songs of the days of the Cavaliers.

With the School of Fine Arts, to which all nations come, Americans are familiar. It is devoted to painting, sculpture, and architecture. Lectures are gratuitous. Annual prizes are distributed, — the first prize entitling the winner to a residence of two years in Rome at the expense of the state.

There is a free school of mathematical, sculptural, and ornamental design, for the instruction of artisans in drawing and architecture, geometry, mensuration, timber cutting, etc.; and several special schools of design maintained by the city, in which plain and freehand drawing from casts, and from life, are taught. Also in every *arrondissement* or ward there are one or more evening schools for drawing, which are largely attended.

Connected with the Jardin des Plantes is a museum of natural history, and a college where a corps of seventeen professors give lectures on all branches connected with plant and animal life.

Napoleon I. founded a school for the instruction of the daughters of members of the Legion of Honor. It now consists of three large establishments, presided over by the Congrégation de la Mère de Dieu, an order of nuns. No Protestants are admitted.

INSTITUTES.

Thus far, we have not spoken of the more illustrious institutes of Paris, and can now give only a brief sketch of their character.

The Institute of France is composed of five divisions: 1. The Académie Française. 2. The Académie Royale des Inscriptions et Belles Lettres. 3. The Académie Royale des Sciences. 4. The Académie Royale des Beaux-Arts. 5. The Académie des Sciences Morales et Politiques.

The institution comprises two hundred and twenty-three members, seven secretaries, thirty-five free academicians, thirty-one associates, and two hundred and twenty-five correspondents.

The Académie Française gives no instruction, but is charged with the composition of the Dictionary and the purification of the language. It consists of forty members.

The Académie des Inscriptions et Belles Lettres is also composed of forty members and ten free academicians, with foreign correspondents and associates. Its object is to cultivate the learned languages, antiquities, and monuments.

The Académie des Sciences has sixty-eight members, ten free academicians, eight foreign associates and correspondents. It is divided into eleven sections of scientific pursuit.

The Académie des Beaux-Arts has forty members, ten free academicians, and has in charge the encouragement of poetry, sculpture, architecture, engraving, and musical composition.

The Académie des Sciences Morales and Politiques has forty members and five sections: philosophy, legislation, public law and jurisprudence, political economy and statistics, political administration and finance, are the subjects of study.

The Academy of Paris consists of five faculties, — letters, sciences, theology, law, and medicine. The first three are established at the Sorbonne. The number of students attendant upon the law course is about 2,500; for medicine, 3,000; for the sciences, 1,500. Foreigners matriculate in law, letters, medicine, or sciences, on producing a certificate from their own countries of having been admitted into corresponding faculties.

The Bureau des Longitudes and the Observatory are each distinct establishments, with faculties and correspondents.

Public instruction in France is divided into superior, secondary, and primary. The first comprises faculties; the second, lyceums and communal schools; the third, elementary schools. The Academy of Paris is composed of these five faculties, as above noticed.

Instruction Superior was thrown open by a law of July, 1875, to any Frenchman twenty-five years of age, or any association of Frenchmen who wished to open schools of letters, law, medicine, or theology, under certain conditions of morality and capacity; but the right to confer a bachelor's degree was not granted. This was reserved by the state. For higher degrees, candidates having followed the courses of the free faculties, as they were called, could claim an examination by a mixed jury composed of both state and free professors.

A Catholic university was at once inaugurated in the Church of the Carmelites, and many other schools under free faculties of *congréganistes*. The attitude of these schools became such that a modification of the law became necessary, placing the right of degrees wholly in the hands of the state, and subjecting the organic laws as well as educational methods of all free faculties to state inspection. The clause of the bill which aimed at this result having failed to become a law, the schools at which it is aimed are to be closed, and the faculties expelled from the country. This is the centre of the great religious conflict now agitating France. There are about three hundred and fifty private boarding-schools for boys in Paris, and four hundred and fifty for girls. There is an Irish college here for the education of Catholic priests, with an average of one hundred pupils, and a Scotch college, to which are sent young men chosen by Scotch and English bishops for a clerical education.

In addition to the above enumeration of educational institutions, there are numerous societies which sustain courses of lectures, museums, and libraries. For instance, the Societie Polonaise has a library of 50,000. The different public offices contain libraries pertaining to their peculiar interests: the Dépôt de la Marine, 25,000 volumes; Home Office, 22,000; Polytechnique School, Civil Engineering, Seminary of St. Sulpice, and the Observatory, have each their particular library of 20,000 volumes.

The National Library contains, of printed works, 2,157,000 volumes, and 300,000 pamphlets; 125,000 volumes in ancient and Oriental languages, 30,000 of which relate to the history of France. There are conserved in this library about 300,000 maps, the topography of Paris alone occupying fifty-six folio volumes. There is a cabinet of 1,320,000 engravings. The library of the Sorbonne contains 110,000 volumes, and that of St. Genevieve contains 150,000. The city library, although destroyed by the Commune, now numbers 24,000 volumes; the Mazarin, 150,000, and 6,000 manuscripts; School of Law has 8,000; of Medicine, 35,000; the Corps Legislatif, 65,000; Archives, 500,000; and the Arsenal, 350,000, with 5,800 manuscripts and beautiful missals. All of these are within the reach of the student at any time.

France has learned the secret of higher education, and understands the value of the eye in the instruction of the mind. Wherever and whenever it is possible, she presents an object to her pupil, and tells him to look at it until he knows it and can draw it. Art is first and last in the curriculum of education. One does not know how little he knows of an image until he attempts to draw it. When he can do that, he has gained sufficient use of the eye to know how to see; and until then, object teaching is comparatively futile. There is not a school of any character in which works of art, such as paintings, engravings, and designs, are not found. By these the eye is taught what to see, as well as how to see it, guided by one who is acknowledged to be a master. The government pays annually 300,000 francs for works of art, and these find a place not alone in galleries, but in the schools of higher education.

I have alluded to various museums and collections of materials peculiar to the instruction of each establishment. This is true even of the primary department of public instruction, which boasts a *musée pedagogique,* where every article pertaining to education, which is devised in France or any other country, is on exhibition;—a library of French school literature, another of German, another of English and American; a globe room; one of maps, charts, and plans; one in which are to be found the natural products of the earth; specimens of woods, grains, eggs: and in time, certain departments of natural history will be added. This is presided over by the accomplished inspector-general of primary instruction, M. B. Beger, who will be pleasingly remembered as the representative of public instruction at the Centennial Exposition at Philadelphia.

F. H. A.

DICTIONARY OF AMERICAN BIOGRAPHY, including MEN OF THE TIME: containing nearly 10,000 notices of persons of both sexes of native and foreign birth, who have been remarkable or prominently connected with Arts, Sciences, Literature, Politics, or History of the American Continent; giving also the pronunciation of many of the foreign and peculiar American names, a key to the assumed names of writers, and a supplement. By Francis S. Drake. 8vo. 1019 double-column pages. Price $6.00 to $12.00 according to binding. Boston: Houghton, Mifflin & Co.

The contrast is very marked between ancient and modern biography. Anciently the leading incidents of eminent men's lives were narrated in their historical sequence, without much attempt to analyze character, and dealing sparingly with eulogy or censure.

Modern biography, like modern history, is much more given to analysis and criticism. The work before us is one of the best specimens of general biographical writing of the modern type, and includes just what is specially valuable to the student of American history. It shows extensive and well-directed research, and makes a very complete and accurate manual of reference, containing in a condensed form all the more important data of American biography. Sketches of many eminent persons still living are included, all of which are judiciously written. The value of such a dictionary depends largely upon its *correctness*, and a careful examination of Mr. Drake's work proves that it is in the main reliable. The wonderful array of facts and dates, with numerous references to other sources of fuller information, adapts it to the wants of every school where American history is studied, and representative characters are analyzed.

In New England, New York, and in many of the older States, the students of biography and history have made available a vast amount of materials for such a work as this, while in many sections of America the materials are exceedingly scanty. The effort has been successfully made to condense the easily obtained matter, and to search out that which is essential to the biography of all who have been connected in any way with the history and development of the whole continent of America. Its value is materially enhanced by its continental character; embracing, as it does, sketches of notable persons in every part of the land. Heretofore, biographical knowledge has been barely limited to statesmen (politicians), authors, and clergymen, while the field of industries, inventions, and the arts has been practically overlooked. Mr. Drake has built for himself a monument of untiring industry in searching out and giving the biographies of American scientists, inventors, engineers, and artisans, to whom the American nation owes very much of its rapid progress in all the arts of civilization. The field is a wide one, and the volume includes nearly 10,000 notices of persons, in which are given the leading points in the life and works of those deemed worthy of such mention.

The pronunciation of all names of difficulty, and the furnishing of a key to assumed names, enhance the value to teachers and students of this biographical dictionary. It is a great convenience, often, to be able to trace the authorship of writings published under a pseudonym. This work is a fit companion to the great books of reference which American scholarship and enterprise have produced in other departments of knowledge. W. E. S.

AN ELEMENTARY TREATISE ON THE DIFFERENTIAL CALCULUS. By Prof. J. M. Rice and Prof. W. W. Johnson. Published by Messrs. John Wiley & Sons. New York.

Sir William Thomson has remarked that those mathematicians who confine themselves to the purely abstract side of their science are likely to miss many beautiful and interesting theorems (beautiful and interesting even from a strictly mathematical point of view), which, were they to give more attention to the physical meaning of many of their processes, could not fail to occur to them.

That there must be truth in this remark is shown by the history of mathematics itself. Thus some of Gauss's finest mathematical speculations were obviously suggested by his astronomical and physical researches. Even his recondite speculations on the theory of numbers seem to have arisen in connection with his work on "Elliptic Integrals," and this work in turn to have been connected with his studies on planetary perturbations, and his conception of a planetary mass distributed in an elliptical ring of variable thickness around its orbit.

Again, the method of solving differential equations by the variation of parameters was first used by Lagrange in the problem of planetary perturbations.

It is said of Euler that almost every form of movement in nature suggested to his mind some problem in dynamics, which in turn often led to some new analytical process.

Prof. Sylvester has recently acknowledged the great help which chemical formulas, and ideas concerning atomicity, have been to him in "conveying an intelligible conception to the minds of others" of the nature of invariants and covariants, of quantics and their relations to each other and to their primitive forms.

It is therefore very desirable, at least for the average mathematical student, that he constantly endeavor to have a clear notion of the physical or geometrical import of his analytical theorems. In many cases they will be unintelligible to him otherwise; at the best he will be in danger of having his mathematical power degenerate into a mere mechanical aptitude, while his logical and imaginative faculties suffer from disuse. Such students often show marked inability to apply, especially to practical problems, the very theorems and processes they have so laboriously acquired. An eminent astronomer once said to the writer of this article, concerning students trained in this purely abstract way, "When I attempt to put them at work, I find them unable to *do anything* with the mathematics they have." Such students often differentiate or integrate expressions set before them remarkably well, and sometimes show considerable ingenuity in the use of analytical artifices to obtain results; but they show a most lamentable deficiency in capacity to take a given problem, and express its conditions analytically in a form appropriate to the case in hand.

To the student of physics no idea is more familiar than that of the *rate* of increase or of decrease in the values of certain quantities, corresponding to changes of position, temperature, or time to which bodies are subjected. It is only necessary to recall rates of expansion or contraction with change of temperature, condensations and rarefactions with varying pressures, velocities, accelerations, inductions of electricity, absorption of light, change of wave length, etc. It is very desirable that an idea so fundamental should be utilized in mathematical instruction, especially in those parts of it peculiarly appropriate to the discussion of this class of changes, viz., the differential calculus.

Notwithstanding its fertility in many ways, the idea of infinitesimals will continue to leave on the minds of many students the impression which was expressed by an otherwise excellent student, that "the whole of calculus was a mass of approximations in which as much was neglected as was retained."

On the other hand the idea of a limit still suggests to other minds than Berkeley's a relationship between "the ghosts of departed quantities."

The authors of the present treatise do not ignore the idea of a limit as the true logical foundation of the calculus; but they reserve the discussion of the differential coefficient as the limit of a ratio, until the student is well grounded in all the ordinary operations of the differential calculus, and is familiar with many of its applications, particularly to the discussion of the theory of plane curves. To use their own language: —

"It is not the intention of the authors to disparage the use of the limit as an instrument of mathematical research. It is only claimed that the difficulties attending the employment of this notion are so great as to render it desirable to avoid introducing it into the fundamental definitions of a subject necessarily involving many other conceptions new to the student.

"The distinction between the view of the differential calculus here presented, and that found in most of the standard works on the subject hitherto published, may be stated thus: The derivative $\frac{dy}{dx}$ is usually defined as the limit which the ratio of the finite quantities Δy and Δx approaches when these quantities are indefinitely diminished [*i. e.*, as the ratio of zero divided by zero]: when this definition is employed, it is necessary, before proceeding to kinematical applications, to prove that this limit is the measure of the relative rates of x and y. In this work the order is reversed, — that is, dx and dy are so defined that their ratio is equal to the ratio of the relative rates of x and y; and in Chap. XI., by applying the usual method of evaluating indeterminate forms [of which zero divided by zero is one], it is shown that the limit of $\frac{\Delta y}{\Delta x}$, when Δx is diminished indefinitely, is equal to the ratio $\frac{dy}{dx}$. Thus the employment of limits is put off, until we are prepared to show that the limit has a definite value, capable of expression in a language already familiar to the student.

"The early introduction of elementary examples of a kinematical character (see pp. 28, 37, and 57; also, Sect. X., p. 76), which this mode of presenting the subject permits, will be found to serve an important purpose in illustrating the nature and use of the symbols employed."

That this is the true method of instruction, few teachers of mathematics or of mathematical physics will doubt.

We find in this volume much that is usually altogether omitted from a college course of mathematics, but which students of physics especially need to know. We notice particularly the sections on hyperbolic functions, De Moivre's Theorem, Bernouilli's numbers, and the extensive chapters on curve-tracing.

That the last, considering its interest and general usefulness, should be so much neglected in American colleges, has been remarked by many mathematicians with surprise and regret. Prof. Olney, of Michigan University, has endeavored, in his excellent treatises on algebra and the calculus, to remedy this evil to some extent.

We think the authors have made a mistake in entirely excluding the integral calculus from this volume.

The mechanical execution of the book is excellent, and we have noticed but two typographical errors.

We are informed that a corresponding work on the integral calculus is to follow shortly.

BIBLIOGRAPHY OF EDUCATION.

RECENT BOOKS AND ARTICLES ON EDUCATION.

BOOKS.

Education, Intellectual, Moral, and Physical. By Herbert Spencer. New, cheap edition. 283 pp. 12mo. Paper, 50 cents. New York: Appleton.

Data of Ethics. By Herbert Spencer. 47 pp. Quarto. (Humboldts Library of Popular Scientific Literature. No. 9, Vol. I.) Paper, 15 cents. New York: J. Fitzgerald & Co.

Xenophon's Memorabilia of Socrates. Edited by S. R. Winans. 290 pp. 16mo. Cloth, $1.50. Boston: J. Allyn.

Works of Virgil. Translated into English prose, with an essay on the English translators of Virgil. By John Conington. Edited by J. A. Symonds. Library edition. Cloth, 463 pp. Boston: Willard Small, and Lee & Shepard.

Literary Studies from the Great British Authors. By H. H. Morgan. 438 pp. Cloth. St. Louis: G. I. Jones & Co.

The Student's Shakespeare. Thirty-seven plays, analyzed and topically arranged for the use of clergymen, lawyers, students, etc. By Henry J. Fox, D. D. Cloth, $5.00. Boston: B. A. Fowler & Co.

Report on Education. By E. Sequin, United States Commissioner on Education at the Vienna Universal Exhibition. Second edition. 215 pp. 12mo. Milwaukee, Wis.

Protestant Foreign Missions. Their Present State: A Universal Survey. By Theodore Christlieb, D. D.: from fourth German edition, by D. Allen Reed. Authorized American edition. 264 pp. S. Map. Cloth, 75 cents. Boston: Congregational Publishing Society, 1880.

History of Philosophy in Epitome. By Albert Schwegler. Translated from first edition of the original German by Julius H. Seelye. Revised from ninth edition, with appendix by B. E Smith. 469 pp. 12mo. Cloth, $2.00. New York: Appleton, 1880.

> Begins with the Greek philosophers and ends with Hegel. The new appendix added to this volume continues the history from the time of Hegel to Schopenhauer, Hartmann, Comte, Spencer, and Hickok. This edition, by a friend and former pupil of Prof. Schwegler, also contains the new matter and modifications of the latest German edition.

True Manliness. From the writings of T. Hughes. Selected by E. E. Brown, with introduction by James Russell Lowell. 302 pp. 12mo. (Spare Minute Series.) Cloth, $1.00. Boston: D. Lothrop & Co., 1880.

> Selections from the writings of T. Hughes, author of "Manliness of Christ," "Tom Brown's School Days," etc.; chiefly relating to such characteristics as ambition, belief, courage, doubt, education, enjoyment, humility, providence, rest, strength, toleration, etc. An autobiographical letter from Mr. Hughes is embraced in Mr. Lowell's introduction.

Encyclopædia Britannica. Ninth edition. Vol. XI., Gou—Hip. American reprint. Philadelphia, Pa.: J. M. Stoddart & Co.

History of the English People. Concluding volume. By John Richard Greene. Vol. IV. The Revolution, 1683–1760. Modern England, 1760–1815. With three maps. 8vo. Cloth, $2.50.

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Methods of Teaching. By John Swett. 12mo. Half leather, $1.25. New York: Harper & Brothers.

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Our Indian Wards: A History and Discussion of the Indian Question. By Hon. G. W. Manypenny, late Commissioner of Indian Affairs. 8vo. Cloth, $3.00.

Hygiene and Education of Infants; or, How to take Care of Babies. By the Société Française d'Hygiène, of Paris. Translated by Dr. G. E. Walton. 24mo. Paper, 25 cents. Cincinnati, Ohio: Robert Clarke & Co.

Art of Securing Attention, The. Joshua G. Fitch, M. A. 43 pp. 18mo. Paper, 15 cents. Davis, Bardeen & Co.

Glimpses of Education in the Sixteenth Century. Roger Ascham and John Sturm. Chautauqua Text-Book. W. F. Phelps, A. M. 53 pp. 24mo. Paper, 10 cents. Phillips & Hunt.

British and American Education. Mayo W. Hazeltine. 32mo. 40 cents · paper, 25 cents. Harper & Brothers.

Chautauqua Hand-Book, The. Chautauqua Text-Book. John H. Vincent, D. D. 61 pp. 24mo. Paper, 50 cents. Phillips & Hunt.

Child Culture, Early, Four Lessons on. W. N. Hailmann. 77 pp. 12mo. Flex., 4to. Paper, 25 cents. Hailmann & Doerflinger.

Kindergarten, The: Its Aims, Methods, and Results. C. B. Morehouse. 44 pp. 12mo. Paper, 25 cents. E. Steiger.

Learning and Health. Benj. Ward Richardson. 39 pp. 18mo. Paper, 15 cents. Davis, Bardeen & Co.

New Departure in Collegiate Control and Culture. Rev. Caleb Mills. 52 pp. 8vo. Paper, 30 cents. A. S. Barnes & Co.

New York State Association of School Commissioners and Superintendents. Proceedings of the Twenty-Fifth Annual Meeting, at Auburn, December, 1879. 64 pp. 12mo. Paper. Davis, Bardeen & Co.

Oxford: Brief Historical and Descriptive Notes. With 10 etchings and numerous illustrations. Quarto. $8 40. Scribner & Welford.

Princeton Book, The. History of the Organization and Present Condition of the College of New Jersey. By Officers and Graduates. Illustrated. Quarto. $20.00; sheets, $18 00; half morocco, $25.00; morocco, $30.00. Houghton, Osgood & Co.

Teaching, Mistakes in. James L. Hughes. 113 pp. 16mo. 50 cents. W. J. Gage & Co.

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MAGAZINE ARTICLES.

Our Common Schools. Charles Francis Adams, Jr., Harper's, November. A sharp, bold criticism of schools, methods, and systems, with the burden of argument in favor of school supervision. Some of Mr. Adams's overdrawn pictures are excellent caricatures of educational methods and work.

Brain and Mind. 5 pp. Appleton's Journal, October. A statement of the scope of Dr Bastian's treatise on "The Brain as an Organ of Mind."

Romance of Literary Discovery. Temple Bar. An interesting account of the discoveries of various valuable literary works.

Oxford and Cambridge. 12 pp. R. Grant White, Atlantic Monthly, September.

Literary Success a Hundred Years Ago. 5 pp. Margaret Hunt, Appleton's Journal, November.

The Growth of Sculpture. 12 pp. Grant Allen, Appleton's Journal, November. A brief sketch of the primitive stages of plastic art.

The Photophone. 12 pp. Alexander Graham Bell, Journal of the Franklin Institute, October. This remarkable paper was read before the American Association for the Advancement of Science at Boston, 1880, by Prof. Bell, and sets forth his new discovery of the producing of sounds by the agency of light.

Evolution and Female Education. S. Tolver Preston, Nature, Sept. 23, 1880. A discussion of Darwin's statement that "The law of the equal transmission of characters to both sexes prevails with mammals."

Hours in a Library. Sterne. 15 pp. Leslie Stephen, Cornhill Magazine, and Eclectic.

English, Rational and Irrational. 21 pp. F. Hall, Nineteenth Century, September. A plea for liberalism in philology.

A Viking's Ship. Architect. This is an account of a remarkable discovery of a war vessel in a funereal hill in Southern Norway.

The Success of the Electric Light. 6 pp. Thomas A. Edison, North American Review, October, 1880. In this article, Mr. Edison states the results of his studies and experiments in photo-electricity, and the superiority and cheapness of electric light.

The Ruins of Central America. Parts I. and II. Désirée Charnay. North American Review, September and October. These are illustrated articles on the recent remarkable discoveries in Central America.

Public Education before the Reformation. 10 pp. Robert Rea, Catholic World, November. This article sets forth the agency of monasticism as a preserver and encourager of learning. The term "public education" has a very limited signification.

Rights and Duties of Science. 24 pp. Principal Dawson, LL. D., McGill University, Montreal, Princeton Review, November.

Philosophy as Scientia Scientiarum. 20 pp. Robert Flint, D. D., LL. D., University of Edinburgh, Princeton Review, November.

Copyrights and Patents. 23 pp. Leone Levi, F. S. A., F. S. S., King's College, London, Princeton Review, November.

Eclipses of the Sun. 17 pp. Simon Newcomb, LL. D. And The Recent Solar Eclipse. 24 pp. Prof. Young. Princeton Review, November.

Education as a Hindrance to Manual Occupations. 15 pp. Prof. S. P. Thompson, Popular Science Monthly, November.

Henry and Faraday. 4 pp. Prof. A. M. Mayer, Popular Science Monthly, November.

The Ruins of Central America. Part III. 9 pp. Désirée Charnay, North American Review, November.

The Coming Revision of the Bible. 7 pp. Rev. Howard Crosby, D. D., North American Review, November.

On the Sources of History, and How they can best be Utilized. 10 pp. James Gairdner, Contemporary Review, October.

The Origin of Music. 18 pp. J. F. Rowbotham, Contemporary Review, October.

West Point and the Colored Cadets. 20 pp. Prof Geo. L. Andrews, International Review, November.

The Muster "Vorstellungen," at Munich. 14 pp. T. C. Felton, International Review, November.

The Unity of Nature. II. Man's Place in Nature. 12 pp. Duke of Argyll, Contemporary Review, October.

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BY

B. G. NORTHROP,

SECRETARY OF CONNECTICUT BOARD OF EDUCATION.

NEW HAVEN:
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1880.

Public interest in home and rural adornment is rapidly increasing in Connecticut, where some fifty associations for Village Improvement have been already organized. A little foresight will show that no community can afford to be without such an association. This good work should go on till not a school house, dwelling or street is left without the simple and grand adornment of shade trees, or shrubbery, vines, flowers or lawn. In many towns such organizations have already done incalculable good in promoting public health, cultivating public spirit, quickening social and intellectual life, and enhancing the value of real estate. I shall be happy to coöperate with public-spirited citizens who are moving in this matter, and will lecture on this subject without charge either for services or expenses in any town in Connecticut. Tree-planting, both economic and ornamental, commands new attention year by year. These papers, reprinted from an official Report, retain a few local allusions to show the original aim of the writer and the application of kindred plans and principles to other fields.

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ECONOMIC TREE-PLANTING.

BY HON. B. G. NORTHROP.

Being neither a scientist nor farmer, I have made no original investigations or practical experiments in forestry. Lest I may seem presumptuous in attempting to instruct others on a great subject in which I am myself a novice, reference is made to my opportunities for learning the matured views of those who, devoting their lives to this study, have made investigations and experiments on a broad scale. Three months of last summer were occupied in visiting "the Foresters," forest schools, and forest plantations of Europe. The letter of Governor Hubbard,* and one from Hon. Wm. M. Evarts, Secretary of State, bespeaking the coöperation of our ministers and consuls, whose aid might be needed, gave free access to all desired sources of information, especially the official "Departments of Forestry," forest schools and their professors, forest plantations, national, communal, or private, and their managers, and the parks and gardens on the Continent and in England. With note-book always in hand, I conferred with numerous authors in this department, as well as practical foresters. Gathering facts from so many experts, and condensing statements from so many sources, it is impracticable in this address to formally quote their language, which I have freely modified and abridged. In addition to the professors of the forest schools visited, and to many diplomatic agents, I am especially indebted to Hon. George P. Marsh, the American Minister to Rome, Captain Campbell Walker, Conservator of State Forests in New Zealand, J. C. Brown, LL. D., long Colonial Botanist at Cape of Good Hope, and J. McGregor, Forester of the Duke of Athole, for information given in personal interviews as well as for that derived from their published works.

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*EXECUTIVE DEPARTMENT, HARTFORD, CONN., June 12, 1877.

I have signed these presents for the purpose of duly accrediting the Hon. B. G. Northrop, of the Board of Education of this State, who is commissioned by said Board to visit the Schools of Forestry and Forest Plantations, and the Industrial Schools of Europe, and report the results of his observations for the benefit of the schools and people of this State, and especially to encourage the reclamation of waste lands by the propagation of trees. I beg to commend Mr. Northrop to the courtesies and co-operation of all persons to whom these presents shall come, and particularly to those who are managers of the institutions above named, and are interested therein. In testimony whereof, I have hereunto set my hand. RICHARD D. HUBBARD.

The literature of forestry, already large, is now rapidly increasing by the coöperation of professors in forest schools, and government officials specially commissioned to investigate different branches of the subject, and many other writers. A German catalogue gives the titles of 1,815 volumes on forestry issued prior to 1842, and the titles of 650 works published in the six years prior to 1876. On an average, over one hundred new books on forestry appear annually in the German language. One of the Spanish Commissioners to the Centennial Exposition, Señor Morera, published a list of 1,126 volumes on forestry in the Spanish language alone.

Little attention has been given in this country to sylviculture. Nature has been wonderfully bountiful in the magnificent forests which once adorned this land, but our people have been recklessly prodigal in wasting this rich inheritance. As if they were the enemies of man, forests have been consumed without a thought of renewing them, and fire has been made to help the axe in destroying what it required ages to produce.

The progress of a nation may be measured to a large extent by its consumption of wood. Extensively as brick, stone, and iron may be substituted for wood in building, and coal used for fuel, the timber demand for purposes of utility and ornament will everywhere increase as civilization advances. The railways are enormous consumers of wood. Says Professor C. S. Sargent: "Supposing the life of a sleeper is seven years, the 85,000 miles of track in the United States consume annually 34,000,000 sleepers, or thirty years' growth on 68,000 acres of the best natural woodlands. At least 125,000 miles of fencing are required to enclose the railroads of the country, costing not less than $43,000,000, with large expenditures for annual repairs. For the construction of 65,000 miles of telegraph lines in the United States, 2,000,000 trees for poles were required, while the annual repairs must call for 250,000 more." A late Agricultural Report of Illinois says: "The fences of the United States cost more than any other class of property except real estate and railroads; the total amount being estimated at eighteen hundred millions of dollars, with an annual expense of ninety-eight millions for repairs." Desirable as may be live hedges, stone walls or ditches, wooden fences are likely to be long used.

But aside from the need of fencing, and the demands for railway and telegraph companies, there are nearly seventy occupations enumerated in the last United States census which in whole or in part use wood as their raw material for manufacture, employing more than one million of artisans, such as carpenters, cabinet-makers, chair-makers, coach-makers, coopers, boat and ship builders, wheelwrights, manufacturers of brooms, brushes, matches, furniture, agricultural implements, machinery and the like. There are 63,928 establishments manufacturing articles made entirely of wood, employing 393,387 persons, and using materials worth $309,921,403 annually. There are, besides, 109,512 establishments in which wood is an important material, as for example, in pianos, carriages, bridges and ships, employing 700,915 persons, and using materials worth $488,530,844. With these facts before us, there need be no fear of an over-production of wood. It is estimated that in our whole country over three million acres of wood-growing land are cleared annually, and this usually without any proper plans for reforesting them. Favorably situated as Connecticut is, in the midst of these industries and near the great market centers, and with new calls for exportation, there is sure to be a growing demand for all desirable lumber.

George Peabody, who did so much to encourage schools and learning, originated the motto, so happily illustrated by his own munificent gifts to promote education: "Education—the debt of the present to future generations." We owe it to our children to leave our lands the better for our tillage, and we wrong both ourselves and them if our fields are impoverished by our improvidence. But much as foresight is admired when its predictions are realized and its achievements made, all history too plainly tells that the mass of men are not easily persuaded to provide for exigencies far in the future. It was more than two centuries after the death of Bernard Palissy, the famous "Potter of the Tuilleries," and after many sad lessons of devastating mountain torrents resulting from excessive forest denudation, before France learned to heed his earnest warning. Expressing his indignation at the folly of such general destruction of the woods he said: "I call it not error, but a curse and a calamity to all France. When I consider the value of the least clump of trees, I marvel at the great ignorance of men who do now-a-days study only to break down, fell and waste the fair forests which their forefathers did guard so choicely. I would think no evil of them for cutting down the woods, did they but replant some part of them again, but they care naught for the time to come, neither reck they of the great damage they do to their children." In 1680, the eminent French statesman, Colbert, said to Louis XIV.: "France will perish for want of wood."

It was not, however, till 1859 and 1860 that stringent laws were passed for the protection of existing woodlands and the formation of new forests. The former of these laws passed the Assembly by a vote of 246 against 4, and the latter with but a single negative voice. The unanimity with which these laws were enacted, though they seriously interfere with the rights of private domain, shows at last the strength of the popular conviction that the protection and extension of forests were matters of national interest and necessity, and would arrest the devastations of mountain torrents and river inundations. The law of 1860 appropriated 10,000,000 francs, at the rate of 1,000,000 a year, in aiding the replanting of woods. In 1865 a bill was passed for securing the soil in exposed localities by grading, and the formation of greensward.

This measure, proved to be beneficial in France, Mr. Marsh highly recommends for adoption in the United States. The leading features of this system are marking out and securing from pasturage and browsing a zone along the banks of ravines, which is carefully turfed and planted with shrubs and trees; consolidating the scarps of the ravines by grading and wattling and establishing barriers of solid masonry, or more commonly of fascines, or other simple materials across the bed of the stream, and cutting narrow terraces along the scarps. Many hundred ravines, formerly the channels of formidable torrents, have been secured by barriers, and by grading and planting, and the success of the system has far surpassed all expectation. The plan of *circling*, long used in this country, is now adopted in France. This plan prevents the wash of the surface, and provides irrigation by running horizontal furrows along the hill-sides, and thus cheaply securing a succession of small terraces, checking the rapid flow of the surface water, obviating one cause of inundations, and greatly fertilizing the lands thus irrigated.

The evils of widespread forest denudation both as regards climatic changes, *uniform* flow of springs and streams, devastation by mountain torrents, and the exhaustion of once fertile lands, have been long and sadly felt in the Old World. Many rich and fertile countries have become arid wastes when denuded of trees. The Mediterranean coast of Africa is a case in point. Tunis and Algiers were once fertile regions, supporting a dense population. Their decadence is traceable largely to the destruction of their forests. Rentzsch ascribes the political decadence of Spain almost wholly to the destruction of the forests.

Mr. George P. Marsh says: "There are parts of Asia Minor, of Northern Africa, of Greece, and even of Alpine Europe, where causes set in action by man have brought the face of the earth to a desolation as complete as that of the moon, and yet they are known to have been once covered with luxuriant woods, verdant pastures, and fertile meadows; and a dense population formerly inhabited those *now* lonely districts. The fairest and fruitfulest provinces of the Roman empire once endowed with the greatest superiority of soil, climate, and position, are completely exhausted of their fertility, or so diminished in their productiveness as, with the exception of a few favored cases that have escaped the general ruin, to be no longer capable of affording sustenance to civilized man. If to this realm of desolation we add the now wasted and solitary soils of Persia and the remoter East, that once fed their millions with milk and honey, we shall see that a territory larger than all Europe, the abundance of which sustained in by-gone centuries a population scarcely inferior to that of the whole Christian world at the present day, has been entirely withdrawn from human use, or at best is inhabited by tribes too few, poor, and uncultivated to contribute anything to the general, moral, or material interests of mankind. The destructive changes occasioned by the agency of man upon the flanks of the Alps, the Appenines, the Pyrenees, and other mountain ranges of Central and Southern Europe, and the progress of physical deterioration, have become so rapid that in some localities a single generation has witnessed the beginning and the end of the melancholy revolution. A destruction like that which has overwhelmed many once beautiful and fertile regions of Europe awaits an important part of the territory of the United States, unless prompt measures are taken to check the action of the destructive causes already in operation."

Indeed we have already a great Sahara in Connecticut produced by improvidence and neglect. The local traditions tell us that the "sand-blow," covering so large an area in the towns of North Haven and Wallingford, which, with its clouds of dust, is a literal eye-sore to all travelers on the New Haven & Hartford Railway, was once finely wooded. Here and there clumps of low cedars and pines, the lone relics of a former growth, still resist the drifting sands. So general is the conviction that this sand blow is utterly irreclaimable that it has long since been abandoned to hopeless sterility. I shall be happily disappointed if my plan for utilizing it is not regarded by many farmers as visionary and impracticable. The feasibility of reclaiming the barren sands of Connecticut, even the wastes of Wallingford and North Haven, is proved by many facts. While agent of the Massachusetts State Board of Education I visited every town of that State, and found thousands of acres in Plymouth and Barnstable counties—once sandy plains—covered with fine forests. The common pitch pine has there been most generally used for the reclamation of sand barrens. Recently the Scotch pine has been widely planted. The seeds were sometimes sowed broadcast, and sometimes dropped in furrows. The cost was trifling, and the profit has been satisfactory.

Hummel attributes the desolation of the Karst, the high plateau lying north of Trieste—until recently one of the most parched and barren districts in Europe—to the felling of its woods, centuries ago, to build the navies of Venice. The Austrian government is now making energetic, and thus far successful efforts for the reclamation of this desolate waste, having planted over half a million of young trees, and sown great quantities of seed. In the vicinity of Antwerp less than fifty years ago was a vast desolate plain. Looking to-day in the same direction from the spire of the cathedral, one can see nothing but a forest, whose limits seem lost in the horizon. Forest plantations have transformed those barren lands into fertile fields. French writers point with pride to an experiment begun eighty years ago on the very crest of a peninsula in Dauphiny, where stands a long stretch of fine forest, and where it had been confidently affirmed trees could not be made to grow.

On the Adriatic, Baltic, Mediterranean, Biscayan, and other coasts, the disastrous encroachments of the sea have been checked by forest plantations. Extensive plains, once barren sands south of Berlin, about Odessa and north of the Black Sea and vast steppes in Russia, are now well wooded. R. Douglass & Sons of Waukegan, Illinois, who have been the pioneers in promoting economic tree planting in the West, began four years ago the experiment of reclaiming barren sand ridges near the shore of Lake Michigan, trying pitch pine, white pine, Austrian pine, and Scotch pine. Here, as on Cape Cod, the Scotch pine proved the best for reclaiming sandy barrens. With these facts from abroad and at home it cannot be denied that even the poorest soils in Connecticut may be reclaimed. The *Pinus maritima*, which proved best for the sandy soils in France, is not adapted to the climate of New England. It has been amply tried, and though growing rapidly for a season or two, is likely to winter-kill. But our native pitch pine, and still better the Scotch pine, are specially adapted to sandy barrens.

Daniel Webster planted many pines at Marshfield, and induced farmers in Plymouth and Barnstable counties to try the same experiment. This has been done very extensively by Mr. J. S. Fay, in Falmouth, near Wood's Hole. In visiting Falmouth I was happily impressed with the beauty and remarkable growth of his tree plantations. There, is a tract of over one hundred and twenty-five acres now densely covered with fine trees. When purchased by him, Mr. Fay says, "It was a barren waste, the soil dry and worn out. On a hundred acres there was not a tree of any kind, unless an oak sprang out from the huckleberry bushes here and there, but hardly lifting its head above them. Indeed, when I bought my place in 1853, except a few stunted cedars on Parker's Point and in the swamps, there was not an evergreen tree within three miles of my house, and hardly any tree of any kind in sight of it. It was maintained that trees could not be made to grow there. The seeds sown were of the native pitch pine with some white pine, the Austrian, Scotch, and Corsican pine, the Norway spruce, and the European larch—in all about thirty-five thousand imported plants, and many thousand native pines. As to the kinds which have done the best, the Scotch pine *from the seed*, including *prompt* germination, has proved the best grower, and very hardy. The Norway spruce and English oak have done well. The larch did not start well from the *seed*, but from the nursery or as imported it has grown remarkably. The hardy Scotch pine does finely either from the seed or the nursery. All these imported trees have done better than the native pitch pine. The larches are about forty feet high, and fourteen inches in diameter one foot from the ground. Some Scotch pines from seed sown in 1861, well situated and in good soil, are thirty feet high, and ten inches through, a foot from the ground. As to profits, one thing is sure. The land, originally poor, has been enriched by the deposit of thousands of loads of leaves upon it, and by the shade afforded, while the soil has been lightened and lifted by the permeation of the roots of the trees; and though no present profit has been yet realized, (which already might have been by sales of the wood,) it should be considered as an investment for future results. Considering the position of my place, on a coast exposed to violent sea winds permeated with salt spray, the vigorous growth and promising appearance of my forest plantations are very encouraging to those more favorably placed. Not only may the destruction of our forests be partially remedied at a cheap cost, but the *waste* and *sterility* of our land by long cultivating be replaced with fertility by the simple process of nature."

The Scotch fir or pine, which Mr. Fay so highly commends, is a native of the Highlands, a hardy tree, and the most rapid grower of all the evergreens suited to our climate—the European larch, a still more rapid grower, being deciduous. It will thrive in the most dissimilar soils and on poorest sands where most other evergreens will not flourish, and makes an excellent wind-break. Its timber is not duly appreciated in this country. In England it is as highly prized as the best Baltic pine, and regarded as superior to our white pine for general purposes. While skeptical on this point, we must at least admit that it is harder, more durable, and more resinous than the white pine. It is light, stiff, and strong, freer from knots than any other fir, easily worked, and well adapted to all kinds of house carpentry. It is extensively used for masts and in naval architecture. In England it yields large quantities of tar, turpentine, and resin. Next to the larch it is the tree most commonly planted in Great Britain. It should be extensively used in Connecticut in reclaiming lands too poor for the larch. It proved a great success in the sandy wastes of Kincorth and Culbin in Scotland, which are now thriving forests.

Among the foresters of largest experience in Europe, I found the planting out system growing in favor, in place of sowing the seed, whether in furrows or broadcast in the fields where the trees are to remain. If sowing is adopted, the land, except on sand barrens, must be well prepared. The general practice abroad is to sow the seed in beds, as beet or onion beds are prepared with us. The Germans speak of the seedlings while in the nursery beds as "in the school," and this phrase happily suggests how they should be treated. The aim is here to start, harden, and root the young plants in a small area where they can be sheltered with brush or otherwise from the scorching sun, and watered if need be in case of drought.

If the seedlings are to be put out close by the garden, they may be planted direct from the mother bed at the end of one or two years. But when they are to be removed to any distance or planted as forests, they should be *transplanted* at the end of the first or second year and planted for forests one year later. The larch and Scotch pine are usually planted permanently, two years from sowing in beds and one year from the planting, that is three years from the seed. The direction is constantly repeated to let the trees grow up *very thickly for a few years*, as they will at first thin themselves on the theory of the survival of the fittest, and after the fifth year the value of the poles will pay for the further thinning required. When planted, the rows should not be more than three feet apart, and the plants stand two feet apart in the rows, giving some seven thousand to the acre, varying with the kind of trees. At the outset the trees are planted more thickly in Europe than in America.

Will it pay the average farmer of Connecticut to plant trees? Certainly not if early profit is essential. The answer depends on various circumstances, such as the size of one's farm, its soil and situation. But in an ordinary Connecticut farm of from sixty to one hundred acres and upwards, I answer yes. If you are looking ahead and seeking an investment for future profit, "trees will make dollars, for they will grow in waste places where nothing else can be profitably cultivated. A soil too thin and rough for cereals may be favorable for trees. Hillsides and plains exhausted and worn out by the plow have often been reclaimed by planting forests. Ravines too steep for cultivation are the favorite seats of timber, and wherever a crevice is found in a rocky ledge, the root of a tree will burrow and spread, taking a hold so firm as to defy the storm, and acting mechanically to disintegrate the rock and change its constituent elements into useful products. By the road-side, the river-bank, along the brook, and on the overhanging cliff, a tree may be always earning wealth for its owners, both in our densest settlements and in the waste places of our most valuable lands." In no way can we ultimately enrich Connecticut more than by planting the choicest trees on our exhausted and unproductive lands. In such situations forests will yield a large percentage of profit. This is a duty we owe to ourselves and to our children.

In many positions forests are of great service as wind-breaks; even narrow strips of trees afford a needful shelter to fruit trees and to various crops, as well as a shield to cattle from piercing winds. Evergreens serve best for screens, as deciduous trees are leafless when their shelter is most needed, especially for stock and around farm buildings. The evergreens most suitable for this purpose are the Norway spruce, white pine, Scotch pine, and Austrian pine; and next to these are the American arbor vitæ, hemlock, and spruce. Sheltered orchards are most productive and less likely to lose their fruit prematurely by violent winds, and the farmer with proper wind-screens consumes less fuel in his house and less forage in his stables. Stated in the order of their obvious advantage to individual farmers, the benefits of tree-planting would be, first, direct profit in timber and fuel; second, the reclamation of waste land; third, shelter; fourth, climatic gain and hygienic influence; and fifth, ornamentation.

The climatic influence of forests has been of late the subject of extensive investigation in Europe, and much evidence gathered showing that forest denudation may result in detriment to the health and welfare of a community. The influence of forests on rainfall, climate, and water supply, has been freely discussed in the schools of forestry and in scientific circles. It is not proved that extensive denudation will cause a marked decrease in the *total* rainfall of any large country. While this is still an unsettled question, recent observations in France, made with great care and complete sets of instruments at different stations, seem to establish the facts, first, that throughout the year six per cent. more rain falls in the forests than in the open fields; second, that of the total rainfall ten per cent. in the forest is caught by the leaves and reaches the earth very gradually, or not at all; and, third, that the evaporation in the open country is five times as great as in a forest.

But on the question of the influence of forests on climate and the *permanent* water supply, there is a growing unanimity among practical foresters and professors in the forest schools of Europe. Their theories and observations plainly show that the wholesale clearing of forests has an injurious effect on both, while the extensive planting of trees on arid regions has ameliorated the climate, prevented mountain torrents, and rendered the water supply more permanent. These investigations show that the general destruction of forests has rendered the climate dryer, more changeable and trying, and that forests on the one hand tend to lower the general temperature of a country and promote the fall of rain at more *regular* intervals, and on the other hand they ward off *sudden* meteorological changes which result in heavy falls of rain and disastrous floods.

It is well known that houses too closely surrounded by trees are damp. Beautiful and healthful as shade trees are, they may stand too near the house. Dense evergreens growing so close as to shut out all sunlight, are harmful. It is an old Italian proverb, that "where the sunlight cannot come the doctor must;" and sometimes the wisest direction of the physician to his rheumatic patient is, to cut down the tree which too densely overshadows the house and excludes all sunlight. The wetness of roads completely overshadowed by trees, shows how forests affect the humidity of the ground they cover. Mr. Marsh says: "One important conclusion at least is certain and undisputed, that within their own limits and near their own borders forests maintain a more uniform degree of humidity in the atmosphere than is observed in cleared grounds." Speaking of the indiscriminate clearing in

America, he says: "with the disappearance of the forest, all is changed. At one season, the earth parts with its warmth by radiation to an open sky, and at another receives heat from the unobstructed rays of the sun; hence the climate becomes excessive, and the soil is alternately parched by the fervor of summer and seared by the rigors of winter."

Wm. Cullen Bryant says: "Our summers are becoming dryer and our streams smaller. Take the Cuyahoga as an illustration. Fifty years ago large barges loaded with goods went up and down that river. Now, in an ordinary stage of the water, a canoe or skiff can hardly pass down the stream. And from the same cause—the destruction of our forests—other streams are drying up in summer." Almost every work on forestry abounds in evidence that extensive forest denudation has everywhere diminished the flow of springs. The case of the famous spring in the Island of Ascension is often cited, which dried up when the adjacent mountain was cleared, but reappeared in a few years after the wood was replanted. Several lakes in Switzerland showed a depression of their level after a general devastation of the forests. Siemoni says: "In a rocky nook in the Tuscan Apennines there flowed a perennial stream from three adjacent springs. On the disappearance of the woods around and above the springs the stream ceased, except in rainy weather, but when a new growth of wood again shaded the soil, the springs began to flow." Marchand says: "The river that from time immemorial furnished ample water-power for the factory at St. Ursanne dwindled so much when the surrounding woods were cut that the factory was at last obliged to stop altogether." President Chadbourne says that Salt Lake contains nearly twice as much water as it did when the Mormons came, and that the water supply is increasing throughout the territory, not by an increase of rain, but cultivation and extensive groves of trees have checked the influence of drying winds and lessened evaporation.*

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*Near my residence (Woburn, Massachusetts,) there is a pond upon which mills have been standing since the early settlement of the town. These have been kept in constant operation until within thirty years, when the supply of water began to fail. The pond owes its existence to a stream which has its source in the hills stretching some miles to the south. Within the time mentioned, I visited the planted forests of the Duke of Athole—whose estates, beginning near Dunkeld in Scotland, extend forty miles by ten—in company with Captain Campbell Walker, now the Conservator of State Forests in New Zealand, who was long employed in the same service in India. He said he had personally observed the drying up of springs and decrease of the *average* amount of water in some of the mountain forests in India, in which extensive clearing had taken place, and that such clearing had unquestionably lessened the *regular* supply for springs and permanent flow in the streams and rivers. While I was in England, the terrible famine in India resulting in the starvation of over seven hundred and fifty thousand people—more than the entire population of Connecticut and Rhode Island—was a prominent theme of public thought and talk and sympathy. Captain Walker, Dr. J. C. Brown, and other foresters expressed the view that forest denudation, diminishing the springs and lessening the former sources of artificial irrigation, was the leading cause of this terrible calamity. Under the early rule of the East India Company, there was a wide-spread devastation of the forests, and in later years the construction of extensive railway and telegraph lines have created a new demand for timber. Recently the English Government has adopted energetic measures for re-foresting the mountains, and placed the remaining forests under the supervision of competent foresters.

In a paper read to the Vienna Geographical Society in 1875, Herr Wex, Counsellor of State, and Director of the Government Works for the regulation of the flow of the Danube, affirms that in the last fifty years the decrease in the average level or comparison of the highest and lowest flow of the Elbe and Oder has been seventeen inches, the Rhine twenty-four, Vistula twenty-six, Danube at Orsova, fifty-five. These measurements, embracing the greatest flood

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these hills, which were clothed with a dense forest, have been stripped of trees, and what was never heard of before, the stream itself has been entirely dry. Within the last ten years a new growth of wood has sprung up on the land formerly occupied by the old forest, and now the water runs through the year. **Dr. Piper**—*Trees of America.*

heights, the lowest flow, and the medium average flow, show that the *floods* are unquestionably higher than in former years, and the contrast between the highest and lowest flow is greater, and that these higher floods are no compensation for the diminution of the medium and low flood, and that many manufactories built during the last fifty years have experienced a marked diminution in the water supply of their streams, and steam-engines have been employed to meet the deficiency of water-power, once ample to do the same work.

The cause of this remarkable phenomena lies in the extensive clearing away of the forests, especially in the mountains, where deluges of rain occur more frequently; for, in lands devoid of trees, the rain water sinks less into the soil, but more speedily reaches the brooks, streams, and rivers, and fills and overflows these water-courses, and results in disastrous floods. The correctness of this conclusion is sadly attested by the now frequently recurring inundations in Italy, in the south of France, Hungary, Bohemia, and in many other lands. It may be worthy of inquiry whether the general clearing of the mountain forests around Salisbury, Connecticut, to meet the growing demand for charcoal for the furnaces, had any connection with the desolating flood which occurred in that town four years ago. A resident of Salisbury, whose farm lies near the base of the mountain skirting that town, says that a stream on his land, formerly never failing, has dried up every summer for the last twenty years.

By several learned societies—like the Royal Academy of Science of Vienna, and the Imperial Academy of Science of St. Petersburg—commissioners were appointed to report upon the paper of Wex, and their reports substantially confirm his views, and say: "Forests exercise a beneficial influence which can hardly be estimated too highly in an increased humidity of the air, a reduction of the extremes of temperature, a diminution of evaporation, and a more *regular* distribution of the rainfall, while the injurious effects of their destruction is seen in an alternation of periods of drought at one time with wasting floods at another." The forests serve as storehouses of moisture, both from their leafy canopy which shuts out the sun, and the myriads, or rather millions, of leaves covering the soil and acting like a sponge, soaking up and retaining the rain and regulating its distribution, while the roots act as vertical drains, favoring infiltration and promoting the descent of the water into the lower strata of the earth, there to nourish the springs.

Among the works of Dr. J. C. Brown on Forestry—the most voluminous writer on this subject in the English language—is one on "*Reboisement* in France," or the replanting of the Alps, the Cevennes, and the Pyrenees, to arrest and prevent the destructive consequences of torrents. He clearly shows from official documents what fearful inundations resulted from the over-clearing of forests, and describes the remedial measures now in progress, which are to extend through many years and to cost over twelve millions of francs. But the loss of property by the terrible inundations in the south of France in 1875 was estimated by the *government* at seventy-five millions of francs, besides the loss of over three thousand lives. This was the work of a single year. The sad lessons of other torrents and other years have now at length led to systematic efforts to re-clothe their mountains.

The benefits that may accrue to our country from the discussion of tree-planting, were strikingly exhibited two hundred and fourteen years ago, when Sir John Evelyn published his celebrated work, entitled, "Sylva; or, a Discourse on Forest Trees and the Propagation of Timber." It was at once received with great public favor, and honored with royal commendation. He had remarkable success in awakening general interest in sylviculture. It was written while he was employed in an entirely different branch of public service, but, as he says, "from an earnest desire to support the credit of the Royal Society, and to convince the world that philosophy was not barely an amusement, fit only to employ the time of melancholy and speculative people, but a high and useful science, worthy the attention of men of the greatest parts, and capable of contributing in a supreme degree to the welfare of the nation." He was one of the founders of the Royal Society, and wrote this book at its special request, and that society has originated few books in the last two hundred years more useful than this which still survives in its grand results, although his other works on painting, sculpture, architecture, and medals have long since been forgotten. In many ways England has recognized her great obligations to the man who worked so lovingly and effectively for the good of his countrymen.

Disraeli, in his "Curiosities of Literature," fittingly says: "Had Evelyn only composed the great work of his Sylva, his name would have excited the gratitude of posterity. The voice of the patriot exults in the dedication to Charles II, prefixed to one of the later editions, in which he says: 'I need not acquaint your Majesty how many millions of *timber* trees, besides infinite others, have been planted throughout your vast dominions at the instigation of this work, because your Majesty has been pleased to own it publicly for my encouragement.' Surely, while Britain retains her situation among the nations of Europe, the Sylva of Evelyn will endure with her triumphant oaks. It was a retired philosopher who aroused the genius of the nation, and who, casting a prophetic eye towards the age in which we live, contributed to secure our sovereignty of the seas. The present navy of Great Britain has been constructed with the oaks which the genius of John Evelyn planted."

What trees shall we plant in Connecticut? One of the most valuable of our native trees is the white ash, and, all things considered, it is one of the most profitable for planting. Combining lightness, strength, toughness, elasticity, and beauty of grain in a rare degree, it is in great and growing demand for farming tools, furniture, interior finishing of houses and railroad cars, the construction of carriages, for oars and pulley-blocks, and many other purposes. The excellence of our ash is one secret of the preference given abroad to American agricultural implements. It is hardy, will bear the bleakest exposure, is a rapid grower, and attains large size, but will not thrive on poor lands. It is every way superior to the European ash, much as that has been cultivated and lauded abroad. It is now found widely in the nurseries and young plantations attached to the forest schools of Europe. Director-General Adolfo Di Béranger, President of the Royal Instituto Forestale at Vallombrosa, pointed me to his plantations of *Fraxinus Americana* with a tone which implied that is the tree of which Americans may well be proud.

The ash is a fine ornamental tree for private grounds, public parks, or for the way-side. When planted closely for timber they grow straight and free from low laterals, and early reach a size that makes the thinnings valuable for poles and fencing. Mr. Budd, a tree grower of Iowa, says: "A grove of ten acres thinned to six feet apart, containing twelve thousand trees, at twelve years were eight inches in diameter and thirty-five feet high, the previous thinning paying all expenses of planting and cultivation. Ten feet of the bodies of these trees were worth, for making bent stuff, etc., forty cents each, and the remaining top ten cents, making a total of $6,000 as the profit of ten acres in twelve years, or a yearly profit of $50 per acre." Mr. Edward Norton of Farmington has about sixteen thousand white ash plants, raised from last year's seed, now in rows to be planted next spring. They are very thrifty, and average about one foot in height. Very few of them died during the summer. He has gathered seed enough for about one hundred thousand plants, which he intends to start next spring.

The seeds of the ash are abundant, ripening by the first of October. They may be easily gathered after the first frost. If sown in the fall they should be covered with three inches of straw. If to be sown in the spring the seed may be mixed with damp sand. With all seedlings care should be taken to keep down the weeds. In some of the nurseries connected with the forest schools, I noticed the seed-beds were protected by green bushes during the hottest and dryest part of the summer. For field planting, the land should be plowed and made mellow in the autumn, that the trees may be planted early in the spring. A little over five thousand plants will be required to the acre, where they are set in rows four feet apart, and two feet apart in the rows. The weeds can be kept down for three years with a cultivator, when the ground will be sufficiently shaded to require no further cultivation.

Connecticut is rich in its variety of native trees, having nearly sixty species, of which about forty are sizable for timber. Among the native trees worthy of cultivation may be named the white ash, white oak, sugar maple, chestnut, hickory, butternut, white pine, willow, and the elm. The latter, when growing under favoring conditions, has been pronounced "the most magnificent vegetable of the temperate zone." Much as the willow has been used as an ornamental tree, its economic value has not been appreciated in this country. The white willow is especially commended by experienced arborists. While most at home in low grounds and beside streams, it is hardy and will grow, though not as thriftily, on dry uplands and in poor soils. Professor William H. Brewer says: "In England, where it is often sixty or seventy feet high in twenty years, there is no wood in greater demand than good willow. It is light, very tough, soft, takes a good finish, will bear more pounding and knocks than any other wood grown there, and hence its use for cricket bats, for floats to paddle-wheels of steamers, and brake-blocks on cars. It is used extensively for turning, planking coasting vessels, furniture, ox-yokes, wooden legs, shoe-lasts, etc. Its charcoal is used for making gunpowder, its bark for tanning, its sprouts for withes and baskets. In some sections of Europe it has been planted from remote times as one of their most valued trees." Starting from cuttings and growing rapidly it can be very easily propagated. Fuller says: "It groweth incredibly fast—it being a by-word that the profit by willows will buy the owner a horse before that by other trees will pay for the saddle." Mr. Sargent says: "As willow timber could be produced far more cheaply than that of any of our native trees, it should soon come into general use here for the purposes requiring lightness, pliancy, elasticity, and toughness—qualities which it possesses in an eminent degree, and for which more valuable woods are now employed. Less than one-third of the willow used in the United States for basket making is produced here, the remainder being imported from Great Britain, France, Holland, and Belgium, at an annual cost of five millions of dollars. The osier proper, the product of *Salix viminalis* and its allies, can be grown without trouble in any wet, undrained soil, capable of producing little else of value; but the better sorts of basket willow are only successfully produced with careful cultivation on rich, well-drained soil. Under such conditions it is a profitable crop, capable of netting at least $150 a year to the acre, and well worth the attention of our farmers." The experiment of raising willows is worth trying, though I do not anticipate so large profits as Professor Sargent promises.

For the reclamation of our pastures and waste lands abandoned to hard-hack, sumac, and other worthless brush, the European larch deserves to become a favorite. A native of the Alps, Apennines, of the Tyrol and Carpathian Mountains, it is a very hardy tree, and at home in a variety of well-drained soils, especially on rough, rocky, or gravelly ground, and the most rugged ravines. There are in our State large tracts of bleak hill-sides and mountain declivities or summits, now practically worthless, where the larch, thickly planted, would soon choke out brush, weeds, and grasses. As an ornamental tree it grows finely even in deep and rich loam, but its extraordinary qualities for timber may be impaired when grown on the rich prairies of the West or the best lands of the East. When raised under right conditions it combines the two qualities of rapidity of growth and durability of wood more than any other tree. This wood was in high favor with the Romans for the building of ships and bridges. Julius Cæsar spoke strongly of its strength and durability.

Last summer I heard a lumber-man in Venice say that its durability was amply attested there, as most of the houses of the city are built upon larch piles, many of which, though in use for centuries, show no signs of decay. In a large Doge's palace, now used as a hotel, he showed me some very ancient larch window-casings which are still sound. For gondola posts in the canals adjoining the houses the larch is preferred. In wharves and many other positions in England where there is an alternation of wet and dry with the tide, the larch has stood this most trying test far better than oak. In England it is regarded as the best timber for railway ties. Monville says: "In Switzerland, the larch, as the most durable of woods, is preferred for shingles, fences, and vine-props. These vine-props remain fixed for years, and see crop after crop of vines bear their fruit and perish without showing any symptoms of decay. Props of silver fir would not last more than ten years." Evelyn says: "It makes everlasting spouts and pent-houses, which need neither pitch nor painting to preserve them." Michie affirms that "For out-door work it is the most durable of all descriptions of wood. I have known larch posts that have stood for nearly fifty years." Professor Sargent expresses the opinion that "For posts it will equal in durability our red cedar, while in the power to hold nails it is greatly its superior." The chestnut railway sleeper loses its power to hold iron in about seven years, though the tie itself may not so soon seriously rot. The larch, while it holds iron as firmly as oak, unlike the latter, does not corrode iron.

The Boston & Albany Railway have larch ties in use for sixteen years which are still sound. The president of the Illinois Central Railway, having examined the vast planted forests of larch in Europe and learned its remarkable fitness for railway ties, offers to transport the young plants free of charge to any point on their lines or leased lines, provided they are to be planted in the vicinity of the same. It is, however, an experiment which time alone can determine, whether the larch will retain its durability when planted in the level, deep, vegetable mould of the prairies, with their retentive sub-soil. That it will grow there rapidly and luxuriantly is amply proved, but its history for many centuries shows that elevated lands suit it better than low grounds, and side-hills and mountain slopes better than flats. In the rich river flats of Kew Gardens and in the vicinity of London the larch does not thrive. The specimens found in that remarkable collection of all known trees are puny. The Kew arborist informed me that in the two hundred and seventy acres appropriated to the arboretum, no spot had been found suited to the larch. Mr. James Brown, an experienced forester of Scotland, attributes the disease, which has of late prevailed in many larch plantations in that country, to planting it, both in the nursery and the field, in uncongenial soil.

No other tree has been planted so extensively in Scotland. It attains maturity long before the oak, and serves well for nearly all purposes for which oak is used. Larch trees thirty years old are sometimes sold for fifteen dollars each, while oaks of the same age are not worth three dollars each. According to Newlands the strength of larch timber is to that of British oak as 103 to 100; its stiffness as 79 to 100; while its toughness is as 134 to 100. As the larch grows erect, with short and slender laterals, it may be planted much thicker than the oak. According to Loudon ten acres of larch will furnish as much ship timber as seventy-five acres of oak. Its large timber yield per acre is one source of its popularity in Britain. It was first planted on the estate of the Duke of Athole, in 1741. Some stately specimens over one hundred and thirty years old may be seen near the cathedral at Dunkeld. Mr. McGregor, the duke's forester, informed me that on this one estate have been planted over twenty-seven millions of larch trees, covering over sixteen thousand acres, some of which was formerly worth only from one to two shillings per acre.

Dr. James Brown says he has seen matured crops of larch of sixty-five years' standing sold for from $750 to $2,000 per acre, when the land was originally worth only from $2 to $4 per acre. Mr. Sargent, director of the Botanic Garden and Arboretum of Harvard College, gives a detailed estimate of the profits of a plantation of European larch of ten acres to last fifty years, calculating the cost for land, fencing, plants, labor, taxes, and interest, and makes the net gain to be $52,282.75, or about thirteen per cent. per annum for the entire fifty years, after retaining the original capital, and he adds: "There are in Massachusetts fully 200,000 acres of unimproved land which could, with advantage, be at once covered with larch plantations, and if so planted their net yield, according to my estimate, in fifty years would be

$1,045,660,000. Supposing that these 200,000 acres will, in the natural course of events, produce, during the same time, one hundred cords of fire-wood to the acre, worth six dollars a cord, amounting to $120,000,000, and subtracting this sum from the net yield of the larch, we have left, as created wealth, the respectable sum of $925,000,000."

Mr. Sargent, however, admits that this is farming *on paper*, and that considerable allowances should be made for such contingencies as fire, tree diseases, insect attacks, and other dangers now unforeseen. Robert Douglas of Illinois, who has had far more experience in larch planting than any other American, writes me that the larch in this country is remarkably free from all disease and insect depredations.

My special aim has been to encourage the recuperation of sterile lands by tree planting. The experiments of thus reclaiming barren tracts, which have been tried on a large scale in many European countries, prove the superiority of the larch for this purpose over all other evergreens, because it is deciduous. Grigor says: "No tree is so valuable as the larch in its fertilizing effects, arising from the richness of its foliage, which it sheds *annually*. The yearly deposit is very great; the leaves remain and are consumed on the spot where they drop." Trees also enrich the soil by a curious chemistry which disintegrates even the rocks, and transmutes their particles into forms of life and beauty. The radicles and rootlets, in their underground laboratory, secrete acids which dissolve the very sands and stones.

The frequency of forest fires is urged as an objection to tree-planting. Here is a real discouragement; but forests are no more likely to be burned than are our barns and dwellings. More property is consumed every year by the burning of stores and houses in this country than by forest fires. This danger, therefore, should no more prevent tree-planting than house-building. But such views need to be spread among all classes of the American people as will produce the general conviction that the interests of all classes are concerned in the protection and conservation of forests. The schools of forestry have made this sentiment wellnigh universal in

Germany, and all classes there appreciate their value and the need of protecting them. Browsing and pasturage in certain limits are prohibited, and yet the forests are not fenced. Simple marks designate where cattle may pasture and where they may not, and an intelligent public sentiment is a better guardian of the national or communal forests than official watchers or national police.

In some portions of Germany the law formerly required every landholder to plant trees along his road frontage. Happy would it be for us if the sovereigns of our soil would make each such a law for himself. Happy, also, if the law of usage, fashion, or interest here, as did the civil law there, required that every young man before he married should plant a tree. In some of our Western States tree-planting by the road-side is encouraged by a bounty from the State treasury, and in the fields by both a bounty and exemption from taxation for a term of years. The law in Minnesota provides that "every person planting, protecting and cultivating forest trees for three years, one-half mile or more along any public highway, shall be entitled to receive for ten years thereafter an annual bounty of two dollars for each half-mile so planted and cultivated, to be paid out of the State treasury; but such bounty shall not be paid any longer than such line of trees is maintained." If I may be pardoned for repeating a personal allusion, the maples which I planted, when a mere boy, before the old homestead in Litchfield county, are now beautiful and stately trees. As I have often said, they have paid me a thousand-fold for the work they cost, and added new charms to that beautiful spot, to which I count it a privilege to make an annual visit. Among the memories of my boyhood, no day has recurred with such frequency and satisfaction as that then devoted to tree-planting. My interest in the subject is due to this incident (or perhaps accident) of my boyhood. I should be thankful if I could help put a similar incident, and an equally grateful experience, into the childhood of our boys of to-day. In this good work may I earnestly bespeak the coöperation of the farmers of Connecticut.

In tree-planting, the economic and ornamental touch at so many points that the cases are rare where they really diverge. Nothing, for example, can add so much to the beauty and attractiveness of our country roads as long avenues of fine trees. I saw this beautifully illustrated in France, last summer, where, for over a hundred miles on a stretch, the road was lined with trees. In many ways the first Napoleon's interest in arboriculture proved a benefaction to France. No time should be lost in securing the same grand attraction to the highways of Connecticut. Growing on land otherwise running to waste, such trees would yield most satisfactory returns. The shade and beauty would be grateful to every traveler, but doubly so to the owner and the planter, as the happy experience of many Connecticut farmers can testify. A grand work in this direction is already well started. No class can contribute so much to the adornment of our public roads as the farmers. They have already in abundance the very best trees for the roadside, such as the elm, maple, ash, American linden (or bass), oak, and in some localities the walnut. The hard maple will thrive in dry and gravelly soils, while the elm and red maple are specially desirable for moist, low ground. As the maples should be planted twenty-five feet apart, and the elms from forty to fifty, poplars or willows or trees growing rapidly from scions, may be placed between, to be cut down when their statelier neighbors require the room for their full development.

Tree-planting is fitted to give a needful lesson of forethought to the juvenile mind. Living only in the present and for the present, too often youth will sow only where they can quickly reap. A meager crop soon in hand, outweighs a golden harvest long in maturing. Youth should learn to forecast the future as the condition of wisdom. Arboriculture is a discipline in foresight—it is always planting for the future, and sometimes for the distant future. Says Washington Irving, "There is something nobly simple and pure in such a taste for trees. It argues a sweet and generous nature to have this strong friendship for the hardy and glorious sons of the forest. There is a serene majesty in woodland scenery that enters into the soul, dilates and elevates it, and fills it with noble inclinations. There is a grandeur of thought connected with this heroic line of husbandry. It is worthy of liberal and free-born and aspiring men. He who plants an oak, looks forward to future ages and plants for posterity. He cannot expect to enjoy its shelter, but he exults in the idea that the acorn which he has buried in the earth shall grow up into a lofty pile, and shall keep on flourishing and increasing and benefiting mankind long after he has ceased to tread his paternal fields." It was the trees of his own planting at Sunnyside-on-the-Hudson, more than the beauty of the surrounding landscape, that led Irving to say, "After all my wanderings, I return to this spot with a heartfelt preference for it over all others in the world." It was the simple beauty he had created at Marshfield,—the grassy lawns, the shaded approaches, the hundreds of trees of his planting,—that bound Daniel Webster so strongly to that sequestered spot. The charm of Abbotsford, the grand Mecca of Scotland, comes mainly from its beautiful ivy and shrubbery and the thousands of trees planted by the hand of its illustrious proprietor. Says Sir Walter Scott, "My heart clings to this place I have created. There is scarce a tree in it that does not owe its being to me. Once well planted, a tree will grow when you are sleeping, and it is almost the only thing that needs no tending."

Any wealthy citizens of Connecticut, who desire to become public benefactors, can hardly find a more inviting field for their liberality than by offering prizes for sylviculture. A few thousand dollars placed in the hands of the Connecticut Board of Agriculture would widely stimulate tree-planting, and greatly enrich the State. The Massachusetts Society for Promoting Agriculture, offer three thousand dollars in the following prizes:

First. For the best plantation of not less than five acres, $1,000; for the next best, $600; and for the next best, $400. For these prizes the European larch must be planted, except in Barnstable, Dukes, and Nantucket counties, where the Scotch pine or Corsican pine must be used, as best adapted to sandy plains. Only plantations made on poor, worn-out land, or that which is unfit for agricultural purposes, and containing at least 2,700 trees to the acre, can compete for these prizes.

Second. For the best plantation of American white ash, of not less than five acres in extent, $600; for the next best, $400. Plantations originally of less than 5,000 trees to the acre, cannot compete for these prizes.

The following directions for tree-planting are condensed from the recommendations given by the trustees of the prize fund. For planting larch and pine, shallow furrows four feet apart should be run one way across the field. Then by planting in the furrows four feet apart each way, 2,720 plants will be required to the acre. On hilly, rocky land which cannot be plowed, it will be only necessary to open with a spade, holes large enough to admit the roots of the plants. *The larch must be planted as early in the season as the ground can be worked.* No other tree begins to grow so early, and too late planting is a common cause of failure. The Scotch and Corsican pines can be planted up to the first of May. The roots should be exposed to the wind and sun as little as possible. Carelessness in this particular is often fatal to the young plants. The trees should be carried to the field in bundles, covered with wet mats, and not be removed till they are required for planting. The roots should be carefully spread out in the holes or furrows prepared for them, and the soil worked among them with the hand, and finally pressed down with the foot. A cloudy or rainy day is especially favorable for this work. All young plantations *must be protected* from browsing animals, the greatest enemies, next to man, to young trees and the spread of forest growth.

If the New York, New Haven & Hartford Railroad reclaim the strip of land bordering their line through the "sand-blow," the example would be a benefaction to the State as a demonstration of what may be accomplished under the most unfavorable circumstances. If that desert can be reclaimed, surely all other barrens in Connecticut may be fertilized by forests. This enterprise will require time, faith, patience, and money. For the first four years the young trees may seem to barely struggle between life and death, after which they are likely to grow rapidly. As this scheme will be regarded as chimerical by those who have not investigated the subject, I give below extracts from letters which I have received from practical tree-planters on Cape Cod and elsewhere, embodying interesting facts and practical suggestions.

John Doane, Orleans. (Mr. Doane, now eighty-six years of age, is the oldest living sylviculturist in Barnstable County.) I have planted one hundred acres in Orleans and seventy in Brewster. The whole plantation in Orleans is about five hundred acres; in Eastham seven hundred acres; in Wellfleet four hundred; in Truro six hundred; in Chatham, Harwich, Dennis, and Yarmouth, about four hundred each; and in Barnstable six hundred acres. In regard to the other towns on Cape Cod I have no definite information, though trees have been planted in many towns on the Cape. I have made a machine for planting the seed, that I have lent to the tree-planters in five of the neighboring towns. The land I have planted with pines was not worth over fifty cents per acre before planting, and I have sold some since covered with young pines, for fourteen dollars per acre. I consider it a good investment.

John Kenrick, South Orleans.--My experiments in tree-planting have been made on over a hundred acres now covered with trees from one to thirty-five years old, chiefly pitch pine. I am now trying Scotch and Corsican pine, and European larch. My first aim has been to cover my worn-out lands with beauty and verdure, and it has proved a successful and economic experiment. The seed of the pitch pine is worth from one to two dollars a pound, the higher price being in the end the cheapest. Fresh seeds, *carefully gathered,* are as sure to vegetate as corn, but obtained from seedsmen, they are very unreliable in germinating. European nurserymen take far greater pains in gathering forest tree seeds, and understand the art of curing them better than Americans. I have tried every method of tree-planting, transplanting trees from the smallest to those that are two feet high. This is a costly plan, but may be adopted when one wishes to save time, and desires a few trees as a wind-break or otherwise. In transplanting trees *immediately* from my own nursery to the field, my favorite time is just as the buds begin to start in the spring. I have planted seeds both with a planter and by hand. On our light sands a man and boy will plant three acres in a day. Dropping six seeds in a hill, it will take about half a pound of seed to the acre. This is my favorite method, and is more satisfactory in results, though more costly than that of using the plow and planter. When the evergreens are about two feet high I would thin them, leaving one thrifty plant in each hill. I do not trim till they get large, and then cut off only the dead branches.

Tully Crosby, Brewster. In our small town about fifteen hundred acres of old waste land have been planted with pitch-pine. The Norway pine has not proved a success with us. Many old fields bought for fifty cents per acre, and planted with pine twenty-five years ago, are now worth from ten to twenty dollars an acre. The pines grow well for twenty-five or thirty years, and when cut off a second crop springs up immediately, and this crop does better than the first. The pitch-pine takes root and grows *on our barren beach sand where no soil is perceptible.* Our people are now planting trees every year. I have recently planted twelve acres. Two years ago I cut off a lot planted thirty years since, and the land is now full of young pine trees growing from the seed scattered by the first growth. A man with a two-horse team can plant ten acres in a day, and three pounds of seed will do the whole.

E. Higgins, Eastham. Thirty years ago twenty acres of condemned tillage land, worth one dollar per acre, was planted with pitch pine. The present value of this land is fifteen dollars per acre. Prior to 1870, two hundred and twenty-five acres more of the same sort of land was thus planted, the present value of which is eight dollars per acre. About one hundred and fifty acres of *sandy* land, utterly barren and not worth fifty cents to the acre, have been planted, the present value of which is seven dollars per acre.

John G. Thompson, North Truro. About six hundred and fifty acres have been planted in this town. The price of pitch-pine seed for the last few years has been one dollar and fifty cents per pound. Thirty years ago land in this town could be bought for twenty-five cents per acre for tree-planting; now the same kind of barren land sells for two dollars per acre for tree-planting. I find the expense of planting the pines to be two dollars and twenty-five cents per acre.

S. B. Phinney, Barnstable. Large tracts of worn-out lands in this county, that were worth comparatively nothing, have been planted from the seed of the pitch-pine. These experiments have proved successful. I know of no way in which the light sandy lands in this section can be made so valuable as by planting them with the pitch-pine. Our experience proves that the cultivation of forest trees is feasible and profitable in New England seaport towns. In 1845 I planted in this town a ten-acre lot with pitch-pine seed, much as corn is planted, dropping three seeds in a hill and covering them with half an inch of soil. To-day many of these trees will girth more than a man's body. Hundreds of acres in this section are being planted annually.

J. E. Crane, Bridgewater. The most profitable tree we have planted in this region is the white pine, with which about two hundred acres have been planted on old worn-out pasture and light sandy soil. The cost of planting, that is, *setting out young trees* twelve to eighteen inches high, is about eight dollars per acre. Properly set out, scarcely one in fifty will fail. There is in this vicinity an acre that was set out thirty-five years ago, that has just yielded in cash for the *wood and lumber*, $350. On another acre, planted twenty-eight years ago, there is estimated to be from eighty to one hundred cords. These are unusual specimens, but fifty cords per acre in twenty-five years, is a low estimate on land natural to pine, and pine is the most valuable growth of wood in the Old Colony.

F. Collamore, Pembroke. Forty years since, Hon. Morrill Allen, "the model farmer" of Plymouth county, planted white pines which grew rapidly, and have proved very valuable for the manufacture of wooden packing-boxes. His example has been followed to a limited extent. Every one believes in the profit of it, but we are in a well-wooded region, and when a lot is cut off it soon starts up again.

Robert Douglas and Sons, Waukegan, Illinois. We have propagated the European larch for nearly twenty years. For a number of years, and until the financial collapse, we sowed over *one thousand pounds of larch seeds* annually, averaging five to seven thousand plants to the pound of seed. The larch grows finely and rapidly in the New England States, in northern Illinois, Iowa, Minnesota, and Wisconsin. It grows nearly as fast, and makes more durable timber on poor lands than on very rich lands. There is no land so poor, except blowing sands, but that it will make a rapid growth after it is once fairly established. It is a tree adapted to a northern climate, and does not thrive in Kansas, southern Illinois, and south of Pennsylvania. We are growing the native cherry (*Cerasus seratina*) in large quantities, as it is healthy, transplants well, grows rapidly on land far from rich, and the timber is very valuable. We will send our catalogues, giving fuller information, to any party in Connecticut on application. The European larch should be planted as early as possible in the spring. It should never be planted on low wet ground. Set out early, no tree will bear transplanting better. Scotch pine and larch do well mixed. We recommend planting a few rows of the admixture on the margin of the plantation. When planted four feet by four, as we advise, they can be worked both ways with the cultivator for two or three years, when the branches will shade the ground so densely as to destroy the undergrowth. When the trees are received from the nursery, the boxes should be immediately unpacked and the *roots* dipped into a puddle made of rich, mellow soil about the thickness of paint, and kept in a shaded place till ready to plant, but the tops should be kept dry. Set the trees a little deeper than they stood in the nursery. After treading the earth firmly about the roots, draw a little loose earth up to the trees to prevent the surface from baking.

Francis Skinner, Brookline, a Trustee of Massachusetts Society for Promoting Agriculture. I will receive and transmit orders for any number of trees for plantations in Connecticut to Douglas & Sons, Waukegan, Illinois. By arrangement with them, such orders transmitted through you are subject to fifteen per cent. discount from the catalogue prices, and such orders can be transmitted up to April 1st, except for European larch, for which the closing time will be March 1st. We are filling our Massachusetts orders from Douglas & Sons in preference to importing from England, as they are cheaper when ordered in large quantities, and the chances of their success far greater. American white ash, one or two years old and about one foot high, are from $3 to $5.50 per thousand; European larch from $4 to $8 per thousand. As this duty is undertaken solely from a desire to facilitate tree-planting, and not for the purpose of any personal gain, I cannot be held responsible in any way for the results.

A. W. Holley, Salisbury, Conn.—The consumption of wood in this and surrounding towns has been very great in supplying charcoal to our numerous iron works. Some of the mountains have been stripped of their trees three times within the last century. The second growth was rapid. Each subsequent one has been less vigorous and less rapid. Other varieties, aided by artificial means, such as seeding, placing cuttings, or transplanting the young trees, might soon render our mountains valuable again for the production of forests. Our landowners have not paid sufficient attention to the propagation of trees. The denudation of the mountains in Salisbury have lessened our streams. In the season of rain there is a more rapid rise and a greater flood than formerly when the forests were standing and the foliage and falling limbs lay quietly covering the earth beneath. Many smaller streams which flowed continuously through the entire season forty or fifty years ago, fail altogether in the summer, and the larger ones are proportionately diminished. Your suggestions in regard to fertilizing our sandy plains are practical, and should be carried out.

Experiments are now in progress to fix the dunes or sand hills which threaten the Suez Canal, by planting the maritime pine and other trees. Last summer I visited the celebrated forest of Fontainbleau, in France, which covers an area of sixty-four square miles. The soil of this wide tract is composed almost entirely of sand, and apparently as dry as the sand plains of Wallingford. Jules Claré, a student of forest science of world-wide fame, says: "The sand here forms ninety-eight per cent. of the earth, and it is almost without water; it would be a drifting desert but for the trees growing and artificially propagated upon it." What has been done with signal success at Fontainbleau shows the practicability of reclaiming the worst deserts that can be found in our State. Many other facts might be cited were it necessary, both from home and foreign fields, to prove the feasibility of this plan of reclaiming sterile lands. If one is to be commended who makes two blades of grass grow where but one grew before, how much more the farmer who makes forests thrive where nothing now grows.

SCHOOLS OF FORESTRY.

The experience of Europe long since demonstrated the value and necessity of "Forest Schools" so numerous on the Continent. As these institutions are unknown in this country, a detailed statement of their aims and character will not only be of interest, but I hope, will help towards the organization of similar schools in America. In connection with either of our Colleges, the endowment of two additional professorships, or even one at the outset, might inaugurate a Department of Forestry. As the applied mathematics and the sciences comprise so large a part of the curriculum of Forest Schools, a Forest Department could very easily and economically be annexed to the Sheffield Scientific School, where the existing cabinets, laboratories and philosophical apparatus could be utilized in forestral instruction. The endowment of such a department would prove a great benefaction to the State and to the country, opening new fields of investigation which would bear directly on the ultimate resources and permanent prosperity of the nation. The conclusions of foreign foresters, though confirmed by the broadest observations and experience in Europe, cannot all be wisely adopted in American Sylviculture. Difference in soil, climate and other conditions, may affect trees in regard to their rapidity of growth, health, durability of timber, texture, elasticity and grain of the wood, and many other qualities. These vital questions can be determined only by careful investigations carried on in each country. The Lombardy poplar, for example, sending out its almost upright laterals from the very ground all along its tall stem, grows beautifully in Italy, and is still a favorite with the Italians as of old with the Romans, who, it is said, gave it the name *arbor populi.* But in New England so many of its branches winter-kill that it soon becomes an unsightly collection of dead limbs.

Another object of my recent visit to the leading schools of Forestry in Europe was to gather the practical plans and suggestions embodied in my paper on "Economic Tree Planting," first published in the Report of the Connecticut Board of Agriculture, and thus help reclaim our exhausted lands by tree planting. As these lands have been abandoned to hopeless sterility, and their reclamation has already been pronounced a visionary and impracticable scheme, I have shown that the experiment of reclaiming vast barrens in France, Germany, Russia, Austria and other European countries, has been tried with conspicuous success. What has been done on so broad a scale and with such grand results in Europe surely can be accomplished in the comparatively narrow barrens of the New England States.

Another purpose of my journey was to do something towards making our youth practical arborists by awakening a love of trees and an interest in their study and culture. From a wide field of observation, I tried to collect such facts as seem fitted to further the work of rural adornment, in which encouraging progress has already been made in our State. A few oral lessons in our schools on rural art, and especially on the beauty, variety and value of trees and the ease and ways of their propagation, would be as good seed sown in good ground bringing forth fruit an hundred fold. Very little time would be required for those school talks which would be sure to inspire an interest in the study and culture of trees, and in the broader subject of rural art and adornment. To all of the teachers of Connecticut inclined to give such instruction in their schools my "Economic Tree Planting" will be sent without charge, at least so long as the thousand copies printed for that purpose may last.

The planting of the Syrian Willow, the supply of which fell far short of the demand, was designed as a *mere beginning*, sure to lead to something more and better, and to interest our teachers and youth in the broad subject of tree-planting. Beautiful as is the weeping willow, I was careful to say "I should greatly prefer to start five thousand elms or maples if it could be done as easily as my five thousand willows seem likely to be stuck in the ground." While regretting that so many applicants should be disappointed, I urge those who failed to get the willow (and I expect the same of all who succeeded), to try the far better plan of planting our common but very beautiful white ash or elm, maple, white oak, tulip, American linden—or the Scotch fir and European larch. I advise our boys also to raise these trees from the seed which may be easily gathered every autumn.

The Schools of Forestry have exerted a remarkable influence in Germany in diffusing among the people a general and genuine interest in arboriculture. They regard forests as their friends, and understand their climatic influence and economic value in staying spring torrents, preventing summer droughts and supplying lumber and fuel. The Germans have a passion for nature, and love to frequent their beautiful groves and gardens, for parks and woods abound in or near their cities and towns. The rural and suburban adornment, now the pride and glory of so many beautiful towns in Germany, and the fruit of this revived love of arboriculture, is largely due to the influence and literature which have emanated from her Schools of Forestry. Hence the wanton forest fires so common and destructive in America are comparatively unknown in Germany. The forest incendiary would be regarded as a common enemy, like the poisoner of an acqueduct, recklessly destroying that which it is the interest of all to preserve. The Forest Schools have created a healthful public sentiment which constitutes the best possible protection of the woods.

Efforts are now making to organize a Department of Forestry in connection with the University and new Arboretum of Edinburgh. Hitherto Forestry has been little taught in England, and her young foresters have therefore been educated on the Continent. There is a growing conviction of the need of such institutions in England, due largely to the able and persistent exertions of Rev. J. C. Brown, LL.D., to whom I am indebted for many statements given in this paper. The London Journal of Forestry says: "The University of Edinburgh possesses remarkable facilities for the creation of a School of Forestry, which with some slight additions could be easily converted into a thoroughly equipped Forest Department, capable of teaching the science of Forestry in the most complete and efficient manner.* Such an Institution is one of the greatest wants of the age in this country, and no country in the world requires it more. With India, Canada, Australia, New Zealand and South Africa, not to mention numerous smaller dependencies of the British Empire, crying out to us to furnish them with thoroughly educated foresters, to conserve and restore their fast disappearing forests, or to create new ones, it is a standing blot on the institutions of our country that we cannot educate and qualify at home the men who are needed for this important service. Such an institution would be of inestimable value to India and all our colonies, and exert a most beneficent influence on the management and productiveness of our home forests and the rural prosperity of the whole country. The forest wealth of Canada is being rapidly exhausted. The great pine forests on the Ottawa, St. Maurice and Saguenay rivers, with their wonderful net-work of tributary streams, are rapidly disappearing beneath the ruthless ax of the lumberman. All the more accessible parts of these great forests are already cleared of pine timber. That huge tract of forest between the Ottawa and the St. Maurice, which once seemed inexhaustible, is fast disappearing beneath the destroying ax."

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* This language is equally applicable to the Sheffield Scientific School and to several scientific schools in other States.

Dr. Hooker, Director of the Royal Gardens at Kew, says: "Forestry, a subject so utterly neglected in this country, that we are forced to send all candidates for forest appointments to France or Germany for instruction both in theory and practice, holds on the Continent an honorable, and even a distinguished place, among the branches of a liberal education. In the estimation of the average Briton, forests are of infinitely less importance than the game they shelter, and not long since the wanton destruction of a fine young tree was considered a venial offence compared with snaring a pheasant or rabbit. Wherever the English rule extends, with the single exception of India, the same apathy prevails. In South Africa, millions of acres have been made *desert*, and more are being made desert annually, through the destruction of the indigenous forests; in Demerara the useful timber trees have all been removed from accessible regions, and no thought is given to planting others; from Trinidad we have the same story; in New Zealand there is not now a good Kauri pine to be found near the coast, and the annals of almost every English colony repeat the tale of willful, wanton waste and improvidence. On the other hand, in France, Prussia, Switzerland, Austria, Italy and Russia, the forests and waste lands are the subjects of devoted attention on the part of the government, and colleges provided with a complete staff of accomplished professors train youths of good birth and education to the duties of State foresters. Nor, in the case of France, is this law confined to the mother country; the Algerian forests are worked with scrupulous solicitude, and the collection of vegetable produce from the French Colonies in the Museum at Paris, shows that their forest products are all diligently explored." The above criticism of the neglect and inaction of England applies equally to America.

One of the oldest and best schools of forestry in Europe is at Nancy, a beautiful city of great historic interest, pleasantly located on the left bank of the Meurthe, and at the base of a long range of wooded and vine-clad hills, about two hundred miles east of Paris. The parks and gardens of the city are finely adorned with trees and shrubbery. The Department of Meurthe, of which it is the capital, owes much of its rare rural beauty to the influence of this celebrated school. Forestry began to be studied as a science in France during the last century, though these investigations were long interrupted by the French revolution and the consequent wars. On the re-establishment of peace this study was resumed, and the School of Forestry was organized at Nancy, which, enlarged and more fully equipped, is now liberally supported. The cabinets, museums, apparatus and appliances of every sort, seemed to me most complete and ample, although the Director informed me that their choicest material was already packed for the Paris Exposition. Instruction is given gratuitously to those who prepare for the State Forest Service, and the importance of this service may be inferred from the fact that the State forests cover an area of nearly three millions of acres, or about the size of Connecticut, with a gross revenue of about seven millions of dollars, or deducting all expenses, a net revenue of over five millions of dollars. The total expense for board, lodging, uniform, instruments and pocket money, is from four to five hundred dollars a year. To "foreign students" a moderate charge is added for tuition. I found a considerable number of English students in attendance here last summer, who are candidates for forest service in India.

The course occupies three years. The daily work requires ten hours, and fifteen hundred hours must be given to study, each half year. In the Winter Session, from November 1st to May 1st, seventy-five lectures of an hour and a half each are given on forest economy, and the same amount of time is allotted for preparation of the special topic of each lecture, embracing in the course, the exploitation of forests; relation of forests to climate; natural history of different kinds of trees; management of forests; conversion of one form of forest into another; and desirable qualities and defects of woods. The same number of lectures and the same amount of study are devoted to botany—the structure, organs, physiology and geographical distribution of plants. Of the seventy-five lectures devoted to mathematics, twenty are taken up with land-surveying and levelling, fifteen hours are given to the preparation of plans under the direction of a professor, twenty-two hours to elevations in water-colors, the same time to sketches and descriptions of rising grounds and to diagrams and calculations of polygonal figures, and also to elevations and designs in hatchwork. There are also lectures and lessons in road and bridge building, such as may be required in the exploitation of forests; in forest law and in the German language, together with some military instruction and drill, and practice in horsemanship.

In the Summer Session, from May to September, thirty-one days are spent in botanical and professional excursions in the Vosges, the Jura and other mountains, in which are visited forests in all stages of treatment and exploitation, and where the students are required to practice in the mensuration of wood and timber. Six days are allotted to preparing a report of the tour of observation and an herbarium of the plants collected. Seven days in the field and fifteen hours in the study are given to making a diagram with report, full calculations and topographical plan, including levels and a reduced drawing of the same, and one day in each section of the forest visited to a mensuration of a supposed felling and the preparation of an official report of it. Five days of work on the ground are given to the study of an imaginary projected road, and twenty days to making drawings and specifications and estimates relating to embankments, consolidating the scarps of ravines, building barriers of masonry or fascines across the bed of streams, and cutting terraces along the scarps. Six days are spent in military reconnaissance with reports and sketches, and in competitive rifle-shooting. The examinations occupy twenty-one days, and eighteen are spent as holydays.

In the second year substantially the same topics of an advancing grade are pursued with an equally full course of study and lectures. The season for cutting timber, the ages of different kinds of trees to be felled, the proper time for a revolution or forest crop and its restoration; mineralogy, lithology and the geological features of France; saw-mills and everything relating thereto, are among the additional studies of the third term. In the summer session, twenty-three days are spent in the forests of Meurthe-et-Moselle and of the l'Aine, in the study of the management of fellings formed of mixed timber, and of coppice being converted into timber forest, and fourteen days are allotted to the preparation of reports of these observations. Two days are devoted to land surveying and six to trigonometrical surveys, making a trigonometrical survey of a forest in the environs of Nancy or of the Vosges, reconnoitering the ground, planting signals, measuring a base line and observing the angles. Twelve days are assigned to the preparation of diagrams and calculations of the net-work of angles and a connection of this net-work with the lines on the map of France. Eleven days are given to the study of the saw-mills in the Vosges, five days of work on the ground and six in the class-room are given to preparing a sketch and a description of diagrams of the mechanism of five saw-mills selected as the best specimens found in operation; to experiments in the gauging of water-courses, the effect of water-wheels, and the time required in the work of sawing, and to the general coefficient of waste.

The Winter Session of the third year extends over the five months from November to April, and is designed for advanced students. In addition to some branches already enumerated, zoölogy with especial attention to entomology, the ravages committed by insects upon forests, the means of averting or destroying them and of recovering a forest ravaged by them; the fixation of sand dunes, the reclamation of barren wastes, and the re-foresting of denuded mountains; the geology and mineralogy of the mountains of France, mountain torrents, their causes and the means of preventing them, the plans of work projected and the works accomplished; the chemistry of vegetation and all that relates to the production and assimilation of atmospherical and terrestrial elements. The Summer Session of the third year, continuing five months from the first of April, is largely occupied with field-work and observations, especially in the study of the oak forests of Central France, the coniferous forests of the Vosges and Jura and the reforested regions of the Alps. During the entire course the field excursions are made under the direction of competent professors, and careful memoirs of these journeys and observations, with sketches, plans and diagrams are always required.

Italy has experienced the disastrous effects of forest denudation, in climatic excesses, in spring torrents and summer droughts, or at least, in the great diminution of the summer streams and rivers—the sources of irrigation. A code of forest laws has lately been passed, for the extension and protection of the national forests, and for the replanting of communal and private woods. The scientific training of professional foresters is found needful to repair the great waste and damage done in previous centuries. The officers charged with the administration of these forest laws are mainly graduates of the Royal Instituto Forestale at Vallombrosa. While in Switzerland, a letter from our Minister at Rome, Hon. George P. Marsh (who had been informed of my errand in Europe), strongly advised me to visit Vallombrosa, and a letter from Mr. Marsh to the Director General, Adolfo di Bérenger, secured every facility for observation and information when I did visit that institution. Founded as an abbey by Pope Alexander II. in 1070, it early became one of the most celebrated monasteries of Italy, if not of the world, remarkable for its romantic situation (vallis umbrosa, or shady valley of the Appenines, nearly six thousand feet above the sea), its great wealth, the extent of its lands and of its grand planted forests. The present magnificent buildings were erected about two hundred and fifty years ago (1637). For centuries this place has been visited by distinguished travelers. Dante delighted to ramble among these magnificent scenes. Mrs. Browning says of Milton;

"He sang of paradise and smiled,
Remembering Vallombrosa."

When penetrating these dense forests and clambering up the steep ascents to the valley summit, I felt the fitness of his familiar words, and familiar they deserve to be with all our youth.

"Thick as autumnal leaves that strew the brooks,
In Vallombrosa, where the Etrurian shades
High over arched, embower.
. . . And overhead up grew,
Insuperable height of loftiest shade,
Cedar, and pine, and fir and branching palm,
A sylvan scene; and as the ranks ascend
Shade above shade, a woody theater of stateliest view."

An hour's ride from Florence by the Arezzo Railway brings one to Pontassieve. Thence a drive of some eight miles by a series of zigzags and through avenues of cypress and mulberry trees, leads to the terminus of the carriage road. Grand and extensive views of the beautiful valley of the Arno (Val d' Arno), open at every turn, with fine vineyards, orchards and highly cultivated fields, here and there protected by long dykes from the river floods which forest denudations on the tributaries of the Arno have occasioned. From the road a foot and mule path of three miles up a steep ascent leads to the ancient monastery. Here were workmen cutting spars for ship building, to be floated down the Arno to Pisa, or into the Mediterranean. These Benedictine monks centuries ago understood well the economic value of tree planting. It is due to their sagacity and foresight that these vast lands are now densely covered with various pines, firs, beech and chestnut. The very position of the trees, standing in exact rows, shows that tree planting on a large scale has here been successfully carried on for centuries. The silver firs, planted around the abbey centuries ago, are now magnificent and stately trees.

The following sketch of this Forest School is condensed from a fuller history given me by Director Bérenger. This monastery was appropriated by the State in 1865, and opened as a Forest School in 1867, though its organization was not completed till nearly two years later. As the snow lies deep for three months on these mountain heights, the school is transferred for four months, from November to March, to the old castle of the Counts Guidi at Paterno near the base of the mountain, and only twelve hundred feet above the sea. During the remaining eight months the head-quarters are at the high elevation of Vallombrosa. The contrast in the elevations of the two locations favors the maintenance of two distinct arboretums, the one at Paterno showing the vegetation of Southern Italy, and even the tender exotics of the tropics, while on the heights of Vallombrosa are planted the trees of Northern Europe and America as well as of the Alps. Great varieties of pines, firs, larch, ash, chestnut, oak, beech are cultivated in the nurseries for planting on the slopes and heights of the Appenines. The Director expressed special interest in the culture of the Fraxinus Americana—our white ash. The students each have their small nursery lots in which they try their hands in planting and trans-planting various trees, thus uniting theory and practice.

The Institution has its director and five professors, a library containing nearly 2,500 volumes of forest literature; a well furnished chemical laboratory; a meteorological observatory, where the indications of the thermometer, barometer, pluviometer, anemometer, hygrometer and seismometer are regularly recorded; instruments for tree-measuring and surveying and various arboricultural instruments, models of timber slides; timber carts; sections of wood, indigenous and exotic, and objects of natural history relating to forestry. The professors are appointed by the King, on the recommendation of the Minister of Agriculture. The number of pupils admissible is sixty. Besides the common rudiments, candidates for admission must pass an examination in history, natural history, algebra, geometry, physics and chemistry. The students wear the neat uniform of the Institution, which is that of a forest guard, with oak twigs of gold lace on the collar and cap. The discipline is mildly military, the students respond to the call of the trumpet instead of a college bell, cannot leave the precincts without permission, and are liable to confinement for insubordination. The students make frequent and sometimes extensive excursions through the national and communal forests, with the Professor of Natural History, to observe and collect specimens; with the Professor of Mathematics and Surveying, to make plans and elevations of the surrounding lands, measure the height and girth of trees, calculate the amount of timber, and learn the various methods of management and exploitation of forests, and with Director Bérenger for special exercises in practical forestry. Besides regular lesson trips, a long excursion is made annually to some extensive woods. One of these journeys of observation, occupying a month, extended to Naples during the International Exhibition of Woods used in Ship building, and included the inspection of the leading forests in Southern Italy.

The following is the Curriculum:

First Year. *Mathematics*, including Algebra, Geometry and Trigonometry. *Chemistry*—Organic and Inorganic, with experiments. *Natural History*—Botany, Systematic and Vegetable Physiology. *Forestry*—Theoretic and Practical. *Languages*—Italian, German and French, with Reading, Writing and translating of Forest Literature.

Second Year. *Mathematics applied*—Differential and Integral Calculus, Conic Sections, Measuring Heights of Trees and Cubic Contents, Plan Drawing and Valuation Surveys. *Climatology* and Forest Meteorology. *Natural History*—Botany, Dendrology, Forest Entomology, Geology and Mineralogy. *Forest Economy*—History of Forest Science, Practical Sylviculture, Seasoning of Timber and Exploitation of Forests. *Elements of Agriculture*—Improvement of Soils, Pasturage, Drainage, Agriculture, etc. *Languages*—Exercises in Italian, German and French.

Third Year. *Mathematics applied*—Rates of Growth of Trees. Mensuration, Preparing Charts and Levels, Estimating Condition and Value of Forests, Forest Administration—Statistics of different Woods, Classification of Forests, Reclamation of Barrens and Wastes, Planting of Sand Dunes, and of Marshes. *Forest Land*—Government and Pastoral Rights. *Forest Economy*—Political and National. *Languages*—Italian, German and French.

The first year is mainly devoted to scientific training, and in the second and third years the practical details of forest management are taught. Tracts of land bearing evergreen and deciduous trees of various ages are set apart to be managed by individual students. In the nursery also, each has a division bearing his name where he may show his skill, patience and fidelity in preparing the soil, sowing the seed, watering the plants, and trans-planting the young trees.

In Italy, Germany and France, the advice of the Government foresters is given gratuitously to all tree-planters, and the young trees are furnished from the nurseries connected with the Schools of Forestry at a nominal price far below the cost, in order to encourage tree-planting to the utmost. With all proprietors of forests, whether the State, the Commune, corporations or individuals, the Government enjoins first, what must be done in all cases, and secondly, sets forth what may be done, that is, what is desirable but optional. In certain localities, the owner must get the permission of the forester of his province before he may fell trees on his own grounds. If the interest of that province and of the country require the retention of trees on the mountain tops, the State compensates the owner of the land for any loss thus incurred, or the older and larger trees only are cut, and a continuous forest growth maintained. It is their theory that the forests belong not to one generation only but to all, and each is bound to leave them as good as it found them.

Schools of Forestry in Europe are of two kinds; first those designed exclusively for the study of forest science and its collateral branches, the *Forstakademie;* second the *Allgemeine Hochschule*, or the collegiate or polytechnic institution with a comprehensive course of study, of which forestry is one prominent department. Nancy and Vallombrosa are examples of Forest Schools, pure and simple. Carlsruhe and Hohenheim will illustrate the other class. "The Polytechnic" in Carlsruhe comprises six separate departments, viz: Mathematics, Engineering, Machinery, Architecture, Chemistry and Forestry, with a staff of forty-nine professors, lecturers, tutors and assistants. I was struck with the extent of the eleven "Collections" here provided to aid in instruction, including objects connected with forests; models connected with engineering, machinery and architecture, besides the usual botanic, mineral, and philosophic collections, and an arboretum or forest garden. Professor Meyer said that each of these departments really helps all the others, and the union plan proves the most economic and feasible, and that the two Professors of Forestry here by the aid of their associates accomplish results which require from five to seven professors in the isolated *Forstakademies*.

The Royal Wurtemburg Academy at Hohenheim is a School both of Agriculture and Forestry. Its immense edifice, formerly a summer palace of the Wurtemburg kings, is delightfully situated on very high ground nine miles from Stuttgart. Near the building is a fine park and experimental and botanic gardens, groves and an arboricultural nursery. The botanic garden covering over twelve acres contains some two thousand species and varieties of plants important in forest and naval economy, and an "exotic garden" of twenty acres specially adapted to forest botany. Near by upon the same mountain range is a forest district of about six thousand acres, embracing a variety of soil and of trees. The institution has an extensive collection of implements used in practical forestry, with models of machines and studies pertaining thereto; a museum of forest products, an herbarium containing over ten thousand species, and a very interesting collection of microscopic preparations more extensive than I had elsewhere seen, with a curious collection of pathological specimens, illustrative of diseased malformation and some seven thousand specimens of fruits and seeds. Great varieties of fine wood showing the texture and grain, are exhibited in the museums of all Forest Schools, but this is a remarkable collection of "microscopic specimens"—transverse sections of wood thin as the finest paper arranged in books as photographs are set in the spaces of an album. Held up to the light, these thin sections are translucent, almost transparent, and show the most delicate shades in the grain of the wood. Here is also a collection of noxious insects and all animals harmful to trees. The insects are shown in all their progressive states, as eggs, larvæ, pupa or chrysalis, caterpillar and moth, with their nests, and perforations in the stems or branches, and with samples of the trunk, bark, branch, root, leaf, cone or fruit, both sound and injured. For a careful comparison, the healthy and diseased specimens are placed side by side.

The curriculum fills two years, and in the forest department embraces among others the following topics: Forest Economy; History and Literature of Forest Economy; Forest Products, including Forest Botany, Sylviculture, Forest protection, Technical properties of timber, Uses of forests and forest technology; Forest administration including mensuration of trees and forests, partition of forests for exploitation, valuation of forests and practical management of forests, forest excursions, "demonstrations" in different forest districts, Botanic Garden and Museum of Forest Products, cubic measurements of trees and cubic contents of woods, land surveying and levelling and mensuration of forests with theodolite.

For lodging and tuition, the students, if subjects of Wurtemburg, pay less than forty dollars a year, but foreign students are charged threefold more. Foreigners are admitted who pass the required examination and produce the "ticket of legitimation" from the proper authorities. Dom Pedro appreciates the national importance of forestry in Brazil. I was much interested in an intelligent and ambitious young Brazilian who is here training himself for a forest appointment in his native country.

A striking illustration of the influence of Forest Schools is found in the authorship of their professors and graduates. In the long run, the influence of any institution may be measured largely by the authorship which it prompts. Judged by this test, the Forest Schools of Europe have made a worthy record. By the coöperation of their professors and other writers, and sometimes of government officials especially commissioned to investigate different branches of the subject, the literature of forestry, already large, is now rapidly increasing. A German catalogue gives the titles of 1,815 volumes on forestry issued prior to 1842, and the titles of 650 works published in the six years prior to 1876. On an average, over one hundred new books on forestry appear annually in the German language. One of the Spanish Commissioners to the Centennial Exposition, Señor Morera, published a list of 1,126 volumes on forestry in the Spanish language alone. Director Bérenger of Vallombrosa has published over thirty books and pamphlets, among them one pronounced by Hon. George P. Marsh of great value on "The Absolute Influence of Forests on the Temperature of the Air." He also edits an able Journal of Forestry, "The Giornale di Economia Forestale."

The question has been much mooted in Europe of late, whether Schools of Forestry should be isolated, or connected as an additional department with existing universities or Polytechnic or other institutions of a more comprehensive character. This was the leading topic of discussion at the last Congress of Foresters which was held at Freiburg in Baden, and attended by nearly four hundred members, representing all parts of Germany, also Switzerland, Austria and Russia. The leading German writers on forestry and the most prominent government officials in the management of the Crown and Communal forests were there. The President of the Convention was Dr. Nordlinger, the eminent Professor of Forestry at Hohenheim. The discussion, which was virtually a continuation of the debate begun at the Convention in Mülhausen the year before, awakened great interest and occupied six hours, the sederunt commencing at 8 A. M. and continuing, with an hour's intermission, till 3 P. M.

A brief summary of the leading arguments shows the feasibility of connecting a Department of Forestry with the Sheffield Scientific School. The discussion was opened by Professor Danckelmann, Director of the School of Forestry at Newstadt-Eberswalde in Prussia, defending the separate *Forstakademie.* He contended that Universities are designed to aid thorough investigations in the abstract rather than in the concrete. Though rich fountains of knowledge, they do not teach practical skill. The Forest Academies on the other hand keep the practical ever in view, and the attainment of knowledge is always combined with practice. Four things are essential; first, instruction in the technical work of forestry; next, in the management of forests; thirdly, in scientific research; and lastly, in the practical application of theories. Special schools are best fitted to secure these results. The *Hochschulen* are located far away from any forest, and the professors therefore are less acquainted with practical forestry, and the students, though more varied in their attainments, will fail to know thoroughly the things most essential for their profession; they will remain strangers to forests, and will not learn how to question trees; they may see cases of dead insects and yet learn nothing of the lives and habits of insects. To be a means of instruction, the forest must be a demonstration ground, and should be so situated that it can be visited daily without fatigue or expense. Though the University is the center of culture and aristocracy, each of these is of secondary importance in the training in forest technology. The professors of the accessory sciences are out of sympathy with the forest, and busy themselves with problems irrespective of their relation to forest science. If it be said that the Universities have produced more eminent writers and thinkers than the forest academy, the remedy should be found in the academy and in the enlargement of its course of study, with opportunity for the student to resort to the forest every day, proposing and solving his questions on vegetable physiology and zoölogy.

The speaker appointed to open the discussion on the other side, Dr. von Seckendorff from Vienna, attributed the origin of isolated schools of forestry to the former state of forests, and the limited education required for forest service in a by-gone day. But now a more scientific method of research in forest matters has been introduced, and a higher testing examination is demanded of students in forest science. A liberal education is essential here as well as in the other professions. The advocates of separate forest schools claim two points of especial superiority; first, that their students are better trained in practical forestry, and second, that in these only are the studies conducted with due reference to the requirements of the forester. They assume that in the vicinity of the Allgemeine Hochschulen there are no forests suitable for the instruction of students, and that a purely theoretical education only must here prevail. These assumptions are unfounded.

The number of University and *Hochschule* towns in Germany, richly surrounded by woods is very great. In a line drawn from the coast of the German Ocean to the place of this meeting alone, there are Hanover, Göttingen, Marburg, Giessen, Heidelberg, Carlsruhe and Freiburg, all so surrounded. It is not the extent of a forest which decides its suitability as a means of instruction, so much as its variety of trees and modes of treatment and exploitation.

The second assumption will not bear examination. Science and practical work are not antagonistic to each other. In the Universities instruction does not go beyond what is desirable for every educated man. And there ought to be no ground for the suspicion that any students of forestry choose that department because it makes the least demand upon them. Situated near railways, the Universities have the best facilities for forestral excursions and for fullest demonstrations in the field. As a matter of fact, the special schools do not turn out more practical men, and are not supplied with better districts for excursions, while on the other hand, in the *Allgemeine Hochschulen,* the instruction in the accessory sciences can be more complete and extended, and be given at no additional expense to the State.

After a long and spirited discussion by prominent professors from both classes of Forest Schools, the President, Dr. Nordlinger, desired those who were in favor of combining instruction in forestry with other departments in the university or *Allgemeine Hochschulen* to rise, when seemingly the whole assembly rose, which was followed by vehement applause. When those who favored the separate system were invited to rise, only sixteen members stood up. It will thus be seen that the result of the fullest and latest experience of Europe is in favor of organizing a forest department in connection with some existing collegiate institution.

INDUSTRIAL SCHOOLS.

No feature of the Educational Systems of Germany, Switzerland, Austria, Belgium, France and other European countries is more striking to an American observer, than the large number of Industrial Schools, specially designed to train apprentices and make skilled workmen and competent foremen. These schools are very numerous, and as various as the kinds of industry pursued in each country or province. There has been the greatest progress in manufactures in those countries where these schools have been maintained longest and most liberally. Geneva has for many years maintained a Horological School, and the Swiss watches have long been celebrated throughout the world. Last summer I visited the new Horological Institute then building in Geneva, a magnificent edifice to cost over $200,000, and also witnessed the work of the school then in its old quarters. The course of study and practice covers three years. There were seven instructors, who are experts both in the theory and practice. No one can graduate till he has proved his skill, again and again, by making an entire watch of standard excellence. The patient training of these classes, or rather of each individual member, in the minutest particulars, both in theory and practice, and the criticism of defects in the work done, illustrate the attention given to details in all Industrial Schools.

The same attention to minute details is seen in the Industrial School at Lyons, France, to which the preëminence of that city in the manufacture of silk is largely due. It has twelve professors, and the course of study occupies three years. Here, as in all Industrial Schools, a prominent study is drawing, drawing ornaments, tinted drawings, and sketching plans of machines from memory. Thorough instruction is given in every detail relating to the manufacture of textile fabrics, especially of silks, the natural history of silk, treatment of the silk worm and cocoons, spinning, throwing, weaving and testing of silks; sorting and cleaning; winding, warping and beaming; changing of looms for weaving different styles; defects in operations and their remedies; decomposition of tissues;

chemistry, especially as applied to dyeing and printing; physics with its applications to heating, steam-boilers, drying and ventilation; mechanics, embracing prime motors, materials and construction; hygiene, including physiology, noxious and useful animals, dangerous and unhealthy occupations, contagious diseases and how to avoid taking them; rural economy and "industrial plants." Manual exercises are conducted in the workshops in making, mending, putting up and shipping looms, in turning, filing, forging, fitting and various joiner's and machinist work. Frequent visits are made to the various factories in Lyons, under the lead of an instructor, where every part and process is fully explained. The students afterwards draw from memory plans of patterns and of machines.

About one hundred pupils on an average are in attendance. The regular charge for tuition, use of laboratories and workshops, is $140 a year. Indigent students are aided by the Chamber of Commerce and Municipal Council of Lyons, so that a portion only pay the full tuition. That this school, conducted without aid from the government of France, should be so liberally supported by the citizens of Lyons, and continue to flourish for so long a period, is ample evidence of its great usefulness in the opinion of the most competent judges.

More than sixty years ago France started special schools in the arts of designing, engraving and dyeing; in silk and ribbon weaving and lace making; in carving, stone-cutting and diamond-cutting (hence the diamond-cutting for the world is still carried on mainly in Paris); in porcelain and various ceramic productions, and the preëminence thus gained is still retained. The artistic manufactures of France command the markets of the world. The Industrial Schools more recently organized in Germany, Switzerland, Belgium, Austria, Italy and England, which in the aggregate are numbered by thousands, make these nations formidable competitors in artistic work.

When invited by the Minister of Public Instruction of France to visit the National Porcelain Factory at Sèvres, I expressed to him surprise that such an establishment should come under the supervision of the Educational Department, to which he replied, "It is because it is the duty of this department to supervise and control the Preparatory School for Sèvres, which you should first visit." On inspecting this School of Design in Paris, I found in the lower rooms the methods and work of a first-class drawing school. But in the upper rooms the classes were painting on elegant goblets, cups, plates, vases and other choicer wares, just brought from Sèvres and to be returned there for baking. After witnessing this truly artistic work, I no longer wondered that in the Sèvres factory itself the artisan had indeed become the artist, and that only men of princely wealth could procure the products of this unrivalled establishment.

In Belgium the girls have shared the advantages of Industrial Schools as well as the boys. The schools for training in lace-making and embroidering, in Brussels, have long been celebrated, and kindred schools have more recently been opened in Rowlers, Ghent, Ath, Deerlyk and in many other places in that busy little kingdom. To those familiar with this fact, it was no surprise that Belgian lace shown at the Philadelphia Exposition was unrivalled. Some Industrial Schools are maintained wholly by the central government, others partially, and still others are supported by endowments, and many are private institutions dependent mostly on tuition for support. A large number called apprentice schools are maintained by benevolent associations. These are designed to train boys and girls both in skilled manipulations in various trades, and in the practical studies and theories most helpful in such pursuits.

Belgium, with about fifty industrial schools, and fifteen thousand apprentices graduated from them, Germany with over fifty-two thousand apprentices in fourteen hundred and fifty industrial schools, and France with twelve thousand industrial scholars, show the practical appreciation of these institutions in these countries, which distance the competition of surrounding nations in the great markets of the world. Steam and the telegraph are bringing all nations into such near neighborhood that industrial ascendancy will belong to that country which provides the best industrial education.

The Artisan School established nine years ago in Rotterdam, Holland, has already two hundred pupils and commands the confidence of that community. Candidates for admission must pass an examination in the simpler rudiments, and are expected to remain in the school three years. The institution is both a school and a shop, and the time of the pupils is daily divided between the two. Drawing, Physics and Elementary Mechanics are prominent among the practical studies of the school room. In the shops a great variety of trades are taught, such as stone-cutting, including keystones, steps, thresholds, flooring tiles and placing plinths; masonry, including plain walls, foundations, chimneys, niches, sewers, arches, &c.; smithery, or making cramps, hooks, hinges, nuts, locks, girders, &c. The braziers are taught forging, turning, stretching and soldering, and make water-cans, dust-pans, kettles, basins, springs and various kitchen utensils. The instrument-makers learn to cut screws and worms, forge steel and copper and cast copper objects. The carpenters make chests, desks, trestles, windows, doors and the like. The painters learn to make putty, grind paint, polish wood, set glass, paint letters and to grain in imitation of marble or the choicer woods. In the Philadelphia Exposition the admirable exhibit of the various articles made by these boys proved alike their skill and the practical value of this institution.

In view of the great variety of the work and the need of individual instruction, twenty-one masters are employed in this school. Great prominence is given to drawing, as lying at the foundation of skilled industry. The Director is the teacher of construction and projective drawing. There are four other teachers of drawing—rectilinear, architectural, ornamental and model drawing, and one or more in each of the other departments above named. The boys draw simple constructions from wood, iron or brick work, such as window joints, doors, jambs, ravelins, stair-cases, roof-constructions, brace-works, springs, locks, cornices, architraves, &c. The school studies occupy each morning and the practical instruction in the workshops the afternoon. As soon as the boys are made familiar with the tools, they are entrusted with practical and marketable work, not sham or play-work, but the making of saleable articles for the trade, so that they at once feel that they are engaged in real business. This plan excites the ambition of the boys and adds interest and dignity to their work. The workshops are of the most approved kind and are supplied with the best tools and appliances. In the carpenter's shop, there are benches with their appliances for eighty boys; and in the smithies are all needed forges, anvils, vices, benches, &c., for seventy boys. The directors, on whose authority the above statements are given, say, that on successfully completing their three years course, these boys receive considerably higher pay than those who have not enjoyed the advantages of the school.

Needle work forms a part of the course of instruction for girls in a large part of the elementary schools of Europe. In Switzerland four thousand three hundred and seventy-three females are employed in schools teaching needle work. In some schools I saw these teachers training their scholars in the use of the American sewing machine.

When one has inspected her technical schools and her twenty-nine industrial schools, he is no longer surprised that Switzerland is especially the home of industry, for her mechanics are educated and skillful. Though hemmed in by mountains, without a seaport, with few minerals and no coal, with costly transportation, all freight from the sea board coming over foreign territory, she threatens the ribbon trade of Coventry, rivals the English in muslin and delaine, and the world in watches and wood-carving. More than one million watches are made annually in Geneva and Neuchatel alone. The Swiss are an ingenious and industrious people. They believe in the dignity of labor and in the thorough mastery of some trade. In their industrial schools, prominence is given to drawing, designing and moulding, as well as to practice in the trades. Hence the world pays substantial tribute to Switzerland for the exquisite taste displayed in the decorative arts, their unequaled carvings, their beautiful chasings in gold and silver, their silk ribbons, their watches and music boxes.

The Earl of Rosebury says that the cause of this rapid progress of Swiss manufacture is plainly "the complete and *special* education which she gives in primary schools and *practical* schools, and *trade* schools, and secondary schools, and cantonal schools, all topped up by the great Polytechnic Institute at Zurich. The Swiss manufacturer is master of his business, and his workmen with whom he is in perpetual contact, respect him for this. Master and servant have been at the *same school learning their craft*, and they know it thoroughly."

Public schools, industrial schools and the Polytechnic Institute have in a remarkable manner unified and fraternized the people of these twenty-five cantons. Though separate in race, religion and language, they are one in national sympathy and interest, proud of their history, and prouder still of their recent progress and manufacturing prosperity. While beggars are found everywhere in Europe, there is less pauperism in Switzerland than in any other nation on the continent. With no communism, there is still a general diffusion of property, and almost every one is a land-owner.

In our country by reason of the restrictions imposed by our Trades Unions, apprenticeships are so much lessened that it is now difficult for boys to learn a trade. Hence increasing numbers are growing up to manhood in idleness, without any regular calling, or seeking to earn a livelihood without manual labor. This limitation of apprenticeships is a short-sighted and suicidal plan, sure to cripple our future mechanics. It seeks a temporary gain at the sacrifice of a permanent prosperity, and is depriving many boys of that thorough training in the several trades which is essential to their skill and success. The system of apprenticeship ought to be encouraged as an indispensable part of the practical education of our future artizans. Otherwise our youth must surrender the most lucrative positions to skilled mechanics imported from abroad. This waning of apprenticeships, which cannot easily be remedied, creates the greater necessity for industrial education.

In speaking of the substitution of steam power for hand labor, J. Scott Russell says: "Occupations which require no skill, but only brute force, will necessarily be vacated by human hands. Society, in the march of improvement, is as certain to do without the unskilled, unintelligent and uneducated as it is to do without wild plants and animals." Certainly any system of public instruction which leaves industrial education out of the account is radically defective. Fortunately this was the theory and practice of the early settlers of Connecticut. The founders of this State valued and honored industry. The code of 1650 which stood in this respect unchanged for over one hundred and fifty years required, "That all parents and masters do breed and bring up their children and apprentices in some honest lawful calling, labor or employment, either in husbandry or some other trade, profitable to themselves and the Commonwealth, if they will not or cannot train them up in learning to fit them for higher employments." In 1683, Penn proposed the following resolution, which was adopted by the Provincial Council, "That all children within this province of the age of twelve years shall be taught some useful trade or skill, to the end that none may be idle, but that the poor may work to live, and the rich, if they become poor, may not want." How different would have been the history of Virginia and South Carolina, with their sunny climate and greater natural resources, had the founders of those States preached and practiced these sentiments which have been the source of the thrift, growth and prosperity of the North. Elizabeth Thompson well says: "Honest labor is the need of the hour, alike demanded by the physical, mental, moral and financial condition of the nation. Industrial education alone can bring about this reformation by joining with labor skill, dignity and honor." Industrial schools are now more needed than new colleges. "The danger is not of over education, with earnest aims and in the right channels, but of a genteel and lazy dilettanteism."

I have discussed this subject partly in order to invite the attention of wealthy men to its importance, and ultimately secure liberal endowments for industrial education. The extract from the will of David Watkinson, given below, and the liberal offer of one hundred thousand dollars by Hon. T. M. Allyn for the support of an industrial school in Hartford, show that this need has long been felt. If the Loomis Institute with its large endowment shall be devoted to the purpose of industrial education, it will meet a great and growing want, which no existing institution in the State attempts to supply. If the liberal offer of Mr. Allyn should be continued and accepted, it would be a nucleus around which other gifts would gather till the school should prove a great benefaction to the State. Such, at least, was the result of the donation of Mr. Boynton in Massachusetts.

The Worcester Free Institute was started by the gift of $127,000 by John Boynton. This beginning led Ichabod Washburne to consider the pressing demand for industrial training, and he gave $130,000 to enlarge the resources of the Institute. Further endowments were made by Stephen Salisbury of $250,000, and by the State of Massachusetts of $50,000 giving a total endowment of $557,000. If the surviving members of the Loomis family carry out their present plan, the "Loomis Institute" will have double this endowment. Without even the semblance of dictation in the plans which they alone have the right to form, and with a grateful appreciation of the beneficent spirit they evince, I most respectfully suggest to them, and to other wealthy men who desire to become benefactors of the State, this means of meeting a great public need and erecting a lasting monument to their memory.

The following is the plan of the proposed gift of Mr. Allyn to the city of Hartford, some five years ago.

To the Mayor, Aldermen and Common Council of the City of Hartford:

The undersigned hereby offers to give to the City of Hartford the sum of *one hundred thousand dollars*, to be expended in the establishment and erection of an industrial school (under such rules and regulations as the authorities of the city may from time to time make), for the free education of both boys and girls in the business avocations of life, agriculture and the mechanic arts. The school should be a model, fashioned after our best ideal. It should possess ample grounds for an agricultural department, botanical gardens, and workshops, where all the principal trades may be learned. Every boy, at the same time he is acquiring a knowledge of the arts, sciences and modern languages, should become a practical agriculturist, or master some useful trade. The girls should be instructed in all the practical duties of the household, become familiar with the chemistry of the kitchen, and made to master the art of making any article of a lady's wardrobe, and also they may learn bookkeeping, banking, telegraphy, photography or any other occupation that is within the measure of their strength and adapted to their tastes. In this manner the education of the student would become a healthful exercise and a most fascinating amusement, instead of being (like the present system) destructive to vitality, exhaust-ing the brain, and converting the school-room into an unattractive place little better than a prison.

It is believed that the amount proposed to be given will be sufficient for the purchase of the ground, erect suitable buildings and supply all the tools and apparatus required for the carrying out of the enterprise. The annual expense incurred of running the institution, after deducting the amount it would be entitled to receive from the school fund, should be cheerfully borne by the city. Should the proposition be entertained and the city accept the gift, it may be necessary to execute articles of agreement to secure the faithful performance of the trust assumed by the city.

T. M. ALLYN.

EXTRACT FROM THE WILL OF DAVID WATKINSON, WHO DIED AT HARTFORD, CONN., DEC. 13, 1857.

Codicil No. 11.

Article V. "Desiring to render a public benefit to the community in which I live, and to the State of Connecticut generally, by aiding in the establishment in the town of Hartford of a Juvenile Asylum and Farm School, for the family and school and industrial training of a class of children not now adequately provided for in any educational or humane institution: I do give and bequeath to my Executors the lot of land of about ten acres, surrounded by four streets, known as the Pavilion property, with the buildings standing thereon, and by me estimated to be worth the sum of $40,000 and in addition to said lot the sum of $20,000, said lot to be conveyed in fee simple, and said money to be paid over to Henry Barnard 2d, Edmond G. Howe, William L. Collins, William N. Matson, Henry Clay Trumbull, Daniel C. Gilman, Roland Mather, Newton Case, Alfred Watkinson, John S. Butler, Henry A. Perkins, Albert W. Butler, Edward Goodwin, E. A. Bulkeley, William D. Shipman and Austin Dunham, or such of them as may be living at the time of my decease, as Trustees for the purposes and uses herein set forth, viz:—to aid in the establishment and support of an institution for the relief, protection, instruction, reformation and employment of children between the ages of six and twenty-one years who may be voluntarily entrusted to it for any or all of these purposes by the parent or guardians, or committed to its charge by competent authority.

Article VII. The institution designed to be established and aided by this bequest, is to be organized and conducted on the general principles and methods recognized in the Rauhen House near Hamburg in Germany, and the Agricultural Colony at Mettray in France, as described in Barnard's *National Education in Europe* (Edition of 1854), and in the Boston Asylum and Farm School, incorporated in its present form in 1833, and the New York Juvenile Asylum, incorporated in 1851, with such modifications as may be by the Trustees deemed to be better adapted to the peculiar condition of the people of this State, or which may be suggested by their own experience or that of similar institutions."

The amount of the Watkinson Fund is now $207,000. Of this sum $162,000 is invested in productive funds and $45,000 in land. The last sentence of the will gives the Trustees authority to make such modifications as they may deem needful for the industrial training of the inmates of the School. If industrial education becomes a prominent feature of the Institution, it will, in the words of the will, be "better adapted to the peculiar condition of the people of this State." The principles and methods recognized in the Rauhen House and Mettray School may be inferred from the following statement: The "Colonie Agricole," at Mettray, near Tours, in France, was founded in 1839 as an institution for the reformation and training of children liable to become vicious and criminal. Besides receiving instruction in the necessary school studies, they are taught various useful occupations, such as farming, and the trades of the wheelwright, blacksmith, joiner, carpenter, mason, shoe-maker, wooden-shoe-maker, tailor, rope-maker, sail-maker, etc.

The Reform School of the "Rauhen House," at Horn, near Hamburg, was founded in 1833. Here as at Mettray, the "family system" is maintained. The labor performed includes house-keeping and home-work, field and garden culture, and such occupations as shoe-making, making and mending clothes and bedding, carpentry and wooden-shoe-making, woolen-thread spinning, baking, masonry and painting, house-keeping and basket-making. There are also workshops for printing, book-binding, lithographing, stereotyping and wood-engraving. The girls fill the places of servants, cooks, washerwomen, ironers, laundry-women and seamstresses. The younger girls help the older, make and mend coarse linen, knit and mend stockings, etc.

The German Government has long sought to make industrial pursuits reputable and universal. To this end, members of the royal family have practiced as well as preached the gospel of honest work. In Carlsruhe, I learned of an excellent girls' school in the *Schloss*, in which the Grand Duchess of Baden, the only daughter of the Emperor of Germany, had recently placed her young daughter, with instructions that she should be excused from none of the household industries required of the other pupils, that she should be trained in sewing and knitting, and made as thorough a seamstress as if she were to earn her livelihood by her needle. During her school life she is not to be distinguished by any of the high titles which she may bear in after life. In all respects she is to be on a par with her young companions, receiving no favoritism in view of her rank, but to WORK and play, run and romp, give and take on perfectly equal terms with her companions, and receive exactly the same punishments if remiss in study or work. The present Crown Prince of Prussia early learned the cabinet makers' trade, and at Babelsberg near Potsdam, the Summer Palace of the Emperor of Germany, are shown articles of furniture of superior workmanship made by him. His cousin, Prince Frederick Charles, learned the trade of glazier, and became quite artistic and enthusiastic in his craft. Fine specimens of his work may be seen in the Potsdam Palace, consisting chiefly of colored glass tastefully joined together by means of lead and tin strips, like the fine colored memorial glass windows so often found in churches. Such examples of honoring industry have exerted a vast and beneficent influence throughout the German Empire

EDUCATION AND LABOR.

The great majority of our pupils must work for a living. By the ordinance of Heaven, the necessity of labor is well-nigh universal. Nature and history alike confirm the old decree, "In the sweat of thy face shalt thou eat bread." Teachers and school officers should carefully inquire whether our schools are accomplishing all they ought to do for the working classes. It is a grand result that all are trained to read and write and cipher, and learn something of the other common rudiments. In no part of the world, except Germany, are there so few *native* illiterates as in New England.

The general intelligence of the people is one obvious cause of our exemption from the railway strikes of last summer. The sober second thought prevailed here, while madness ruled the hour elsewhere. But beneficent as has been the influence of the public school in New England, it has by no means done its whole duty to the laboring classes. More should be said and done to dignify labor and prepare our youth to become skilled workmen as well as industrious and upright citizens. It is a mistake to suppose that education need create any aversion to labor, or that those who do the roughest work need the least schooling.

Under the system of slavery in the South, and until recently with the serfs of Russia and the equally illiterate farm hands of England, it was held as an axiom that schooling would make laborers discontented, restless and unprofitable servants, and that universal education would render manual labor distasteful and disreputable. Too much of this mischievous legacy of slavery lingers among us still. The silly and wicked notion that labor is menial ought to be refuted in our schools, where our youth should be early taught the necessity and dignity of labor, as the primal source of all human excellence and progress. Girls as well as boys should be early taught both in the family and school that to learn to be useful is alike their duty, privilege and interest. Education should thus be made the auxiliary of labor. Instead of treating it as a degrading drudgery, education should elevate labor and render it more skillful and productive. If the true bearing of education on industry was taught in our schools, our youth would grow up under the salutary conviction that education is economy, and so far from degrading labor makes it more inviting and profitable, because the skilled workman so forecasts his plans that every blow tells, thus economizing his time and strength and stock, and even in the humblest work, accomplishing more, in better style, and with less damage to tools or machinery, than the boor who can use only brute muscle. Pride in one's work leads to higher excellence both in his craft and character. The skilled artizan who delights to do his best to-day, will aspire to do better still to-morrow. On the other hand, the too common theory that labor is a degrading drudgery will consciously demean any workman and bar improvement in his trade.

Connecticut is a busy hive of manufactories. The industrial interests of no State are more vital to its prosperity. We are a working people, and the cause of the workman is the cause of all. The problem of our State and of our day is to elevate work by educating and thus elevating the workmen. The masses are learning that mere muscle is weak, that brains help the hands in all work, that knowledge multiplies the value and productive power of muscular efforts. If knowledge is power, ignorance is waste and weakness. What a man *is*, stamps an impress upon what he does, even in the humblest forms of industry. The character of the work depends upon the workman. Whatever elevates the laborer improves his labor. In proportion as you degrade the operative even to the degree of serf or slave, you depreciate his work. You can dignify work therefore in no way so surely as by elevating the workman. The wealth and welfare of individuals and States, always dependent on labor, can be most fully secured only by educated labor. If rightly conducted, our schools, so far from breeding discontent with the humblest pursuits, will prepare for success in the ordinary callings of life.

Instead of this, I find in some cases the chief aim is promotion to the next higher grade, and from that up to the highest or High School, and the programme is planned for those who complete the full curriculum, rather than for the majority who withdraw early for work or business. It is worthy of inquiry whether at each successive step the conditions of promotion may not wisely include the same studies and attainments which constitute the best preparation for the business of life, as well as for higher grades in school.

How to secure the best results with the least cost of time as well as money, is a problem not yet fully solved. Our text books, now too voluminous, should comprise less of minute details and more of practical methods and principles. Such topics in arithmetic as the least common multiple of common fractions, casting out of nines in multiplication and division, alligation medial and alternate, and commutation of radix, may well be omitted in a common school course, or briefly noticed in the appendix. Those and kindred topics, of no use in ordinary business, fill a large space in nearly all the arithmetics. They have a traditionary sanction. In continuing them the authors have consulted usage more than utility. Like the titled scions of rank in the old world, they have come down by so long a literary descent that no one disputes their right to their honored place. Worth more than all these complicated processes is the thorough mastery of the ground rules. In all our schools rapid mental combinations should be daily practiced till pupils can add, multiply and divide with the utmost facility and accuracy. This done, the rest of arithmetic will be comparatively easy and pleasant.

Ex-President Thomas Hill justly complains that our "Arithmetics have been expanded until the unfortunate pupil is lost in a wilderness of words, and does not find his way through, in time to learn to cipher. The science of arithmetic receives so much attention that the art is neglected. Life is not long enough to spend so long a proportion of it on arithmetic as is spent in the modern system of teaching it, and arithmetic is too valuable an art to have our children neglect to acquire facility in it, instead of being stupefied and disgusted with premature attempts to understand it as a science." It is certainly a useless repetition to require children to learn, for example, explanations of the first principles of fractions, percentage and the li as they are scattered through four or five volumes, each su cessive series setting forth the same subjects only with grea fullness and complication. In many schools arithmetic is th made a subject of study for eight or nine years, when thr or four years ought to give the pupil the mastery of the esse tials, including rapid mental combinations. He should lea the multiplication table early and thoroughly, and acquire gre rapidity in all practical processes.

By the condensation or omission of too extended serial boo in geography, grammar and arithmetic, and in the latter stu mastering thoroughly only the practical portions and postp ing the intricacies of compound proportion, permutation a the like, that not one in a thousand ever uses in the practi business of life, more time can be gained for reading, spelli writing, the study and use of our own language, compositi at least in letter writing, and elementary lessons in the practi sciences, natural history, political economy, and the history our own country.

WHAT BOYS ARE READING.

A timely appeal to the public has just been made, bearing the signatures of eminent citizens of New Haven who represent both political parties and the Baptist, Roman Catholic, Congregational and Episcopal churches. I welcome this warning, as I have had occasion to observe widely the pernicious influence of bad books and papers. Finding ten years ago that such papers as the *Boston Illustrated Police News*, the *New York National Police Gazette*, and *Day's Doings* were freely sold in the cars, I addressed a letter to the President or Superintendent of every railway in Connecticut asking if I might announce *authoritatively* in my next Report that "the sale of immoral papers is not permitted in the cars or stations of your railway." Cordial replies came promptly from the officers of every railroad of our State expressing their earnest purpose to do their part in the suppression of this great evil. One reply shows the spirit of all. "I fully appreciate your views and most heartily concur in your wish, and will do my utmost to prevent the circulation of such papers." Obscene books, papers and pictures are the worst of outlaws. The most indecent of this class are sold clandestinely. But there are others, sold openly, like those named in the following "appeal," which though less filthy, are more corrupting, if not more infamous than the most lecherous issues of the Parisian press. The poison which nauseates by an overdose, may be its own antidote. Professing to be illustrated histories of the week, these papers are in fact chroniclers of, or contributors to, the bar-room and the brothel. The safety of our youth now demands the utmost effort for the exclusion of such contamination. In behalf of the children of the State, I earnestly invoke the aid and coöperation of all parents, the officers of justice, the public press, and of all good citizens, in efficient measures for the suppression of the evil so well set forth in the following appeal and extracts from the paper of Professor Sumner.

"We desire to call attention to the cheap, trashy literature which is demoralizing the youth of our country. In this class we notice the paper named *The New York Boys' Weekly*, with a reputed circulation of 40,000, and *The Boys of New York*, with a reputed circulation of 50,000. These papers contain stories of the most sensational and slangy character, judging by the titles, of which we name the following: 'Dashing Dick, King of the Highway,' 'Yankee Claude Duval, the Dashing Knight of the Road,' 'Corkey, or the Tricks and Travels of a Supe,' 'Shorty, jr., or the Son of his Dad,' 'Bang Up, or the Boy Ranchero,' etc., etc. We see not one redeeming trait in these or other papers of this class. We are informed that many of the advertisements in their columns are of the most villainous kind. Will you not do what you can to warn your readers against the peril that besets our youth? We inclose Professor Sumner's article, reprinted from *Scribner's Monthly*, which we beg you to use according to your judgment in whole or in part.

Our object is not to advertise any periodical in place of those we deprecate, but only to warn the public of a danger suspected by few and realized by fewer still.

Noah Porter, Leonard Bacon,
Theodore D. Woolsey, Francis Wayland,
William M. Barbour, Hugh Carmody,
James E. English, Edwin Harwood,
Francis A. Walker."

"Few gentlemen, who have occasion to visit news-offices, can have failed to notice the periodical literature for boys, which has been growing up during the last few years. The increase in the number of these papers and magazines, and the appearance, from time to time, of new ones, which, to judge by the pictures, are always worse than the old, seem to indicate that they find a wide market. Moreover, they appear not only among the idle and vicious boys in great cities, but also among school-boys whose parents are careful about the influences brought to bear on their children. No student of social phenomena can pass with neglect facts of this kind,—so practical, and so important in their possible effects on society.

These periodicals contain stories, songs, mock speeches, and negro minstrel dialogues,—and nothing else. The literary material is either intensely stupid, or spiced to the highest degree with sensation. The stories are about hunting, Indian warfare, California desperado life, pirates, wild sea adventure, highwaymen, crimes and horrible accidents, horrors (tortures and snake stories), gamblers, practical jokes, the life of vagabond boys, and the wild behavior of dissipated boys in great cities. This catalogue is exhaustive. There are no other stories. The dialogue is short, sharp, and continuous. It is broken by the minimum of description and by no preaching. It is almost entirely in slang of the most exaggerated kind, and of every variety,—that of the sea, of California, and of the Bowery; of negroes, 'Dutchmen,' Yankees, Chinese, and Indians, to say nothing of that of a score of the most irregular and questionable occupations ever followed by men. When the stories even nominally treat of school-life, they say nothing of *school*-life. There is simply a succession of practical jokes, mischief, outrages, heroic but impossible feats, fighting, and horrors, but nothing about the business of school, any more than if the house in which the boys live were a summer boarding-house. The sensational incidents in these stories are introduced by force, apparently for the mere purpose of producing a highly spiced mixture.

One type of hero who figures largely in these stories is the vagabond boy, in the streets of a great city, in the Rocky Mountains, or at sea. Sometimes he has some cleverness in singing, or dancing, or ventriloquism, or negro acting, and he gains a precarious living while roving about. This vagabond life of adventure is represented as interesting and enticing, and, when the hero rises from vagabond life to flash life, that is represented as success. Respectable home life, on the other hand, is not depicted at all, and is only referred to as stupid and below the ambition of a clever youth. Industry and economy in some regular pursuit, or in study, are never mentioned at all. Generosity does not consist in even luxurious expenditure, but in wasting money. The type seems to be that of the gambler, one day 'flush' and wasteful, another day ruined and in misery.

There is another type of boy who sometimes furnishes the hero of a story, but who also figures more or less in all of them. That is the imp of mischief,—the sort of boy who is an intolerable nuisance to the neighborhood. The stories are told from the stand-point of the boy, so that he seems to be a fine fellow, and all the world, which is against him, is unjust and overbearing. His father, the immediate representative of society, executes its judgments with the rod, which again is an insult to the high-spirited youth, and produces on his side, either open war, or a dignified retreat to some distant region.

These stories are not markedly profane, and they are not obscene. They are indescribably vulgar. They represent boys as engaging all the time in the rowdy type of drinking. The heroes are either swaggering, vulgar swells, of the rowdy style, or they are in the vagabond mass below the rowdy swell. They are continually associating with criminals, gamblers, and low people who live by their wits. The theater of the stories is always disreputable. The proceedings and methods of persons of the criminal and disreputable classes, who appear in the stories, are all described in detail. The boy reader obtains a theoretical and literary acquaintance with methods of fraud and crime. Sometimes drunkenness is represented in its disgrace and misery, but generally drinking is represented as jolly and entertaining, and there is no suggestion that boys who act as the boys in these stories do ever have to pay any penalty for it in after life. The persons who are held up to admiration are the heroes and heroines of bar-rooms, concert saloons, variety theaters, and negro minstrel troupes. From the specimens which we have examined we may generalize the following in regard to the views of life which these stories inculcate, and the code of morals and manners which they teach:

The first thing which a boy ought to acquire is physical strength for fighting purposes. The feats of strength performed by these youngsters in combat with men and animals are ridiculous in the extreme. In regard to details the supposed code of English brutality prevails, especially in the stories which have English local color, but it is always mixed with the code of the revolver, and, in many of the stories, the latter is taught in its fullness. These youngsters generally carry revolvers and use them at their good discretion. Every youth who aspires to manliness ought to get and carry a revolver.

A boy ought to cheat the penurious father who does not give him as much money as he finds necessary, and ought to compel him to pay. A good way to force him to pay liberally, and at the same time to stop criticising his son's habits, is to find out his own vices (he always has some) and then to levy black-mail on him. Every boy, who does not want to be 'green' and 'soft,' ought to 'see the elephant.' All fine manly young fellows are familiar with the actors and singers at variety theaters, and the girl waiters at concert saloons. As to drinking, the bar-room code is taught. The boys stop in at bar-rooms all along the street, swallow drinks standing or leaning with rowdy grace on the bar. They treat and are treated, and consider it insulting to refuse or to be refused. The good fellows meet every one on a footing of equality—above all in a bar-room.

Quiet home life is stupid and unmanly. Boys brought up in it never know the world or life. They have to work hard and to bow down to false doctrines which parsons and teachers in league with parents, have invented against boys. To become a true man, a boy must break with respectability and join the vagabonds and the swell mob. No fine young fellow, who knows life, need mind the law, still less the police. The latter are all stupid louts. If a boy's father is rich and he has money, he can easily find smart lawyers (advertisement gratis) who can get the boy out of prison, and will dine with him at Delmonico's afterward. The sympathies of a manly young fellow are with criminals against the law, and he conceals crime when he can. Whatever good or ill happens to a young man he should always be gay. The only ills in question are physical pain or lack of money. These should be borne with gayety and indifference, but should not alter the philosophy of life.

As to the rod, it is not so easy to generalize. Teachers and parents, in these stories, act faithfully up to Solomon's precept. When a father flogs his son, the true doctrine seems to be that the son should run away and seek a life of adventure. When he does this he has no difficulty in finding friends, or in living by his wits, so that he makes money, and comes back rich and glorious, to find his father in the poor-house.

These periodicals seem to be intended for boys from twelv to sixteen years of age, although they often treat of older pe sons. Probably many boys outgrow them and come to see th folly and falsehood of them. It is impossible, however, that s much corruption should be afloat and not exert some influenc We say nothing of the great harm which is done to boys c that age, by the nervous excitement of reading harrowing an sensational stories, because the literature before us only partic pates in that harm with other literature of far higher preter sions. But what we have said suffices to show that these pape poison boys' minds with views of life which are so base an false as to destroy all manliness and all chances of true succes How far they are read by boys of good home influences we ar of course, unable to say. They certainly are within the reac of all. They can be easily obtained, and easily concealed, an it is a question for parents and teachers how far this is don Persons under those responsibilities ought certainly to kno what the character of this literature is."

WHAT SHOULD OUR BOYS READ?

Teachers can largely determine the reading of their scholars out of school. It is important not only to awaken a love of books, but to guide in their selection and form a taste for profitable reading. Scholars should be encouraged to have some good book always at home, in which they read a little every day. In school they should be invited to tell what they have read. To give an epitome of one's reading is an admirable school exercise. The pupil will peruse a book with ten-fold greater interest, when expecting to epitomize his author before the school. As a drill of memory and in language it is a most useful exercise, and is one that is sure to interest as well as profit the school. Having experienced these advantages in my own teaching, and witnessed them in many schools, I strongly recommend this practice, already adopted by some, to all the teachers of Connecticut. Instead of giving here a list of books for all the youth of the State, I advise teachers to recommend well known works in adaptation to the age, taste and advancement of individual pupils, usually those which they themselves have read, that they may the better appreciate and criticise the epitomes of the same by the pupils.

An eminent teacher recently asked a class of fifty-seven boys, What is the last book you have read? One answered "I haven't read any lately," another, "I don't remember," "can't tell" said a third. But the great majority were able to give an account of their reading, which was most creditable to their teacher, evincing his wholesome influence over his pupils outside of the school room. Twenty-seven had been reading works of history and biography, including Life and Times of Benjamin Franklin, Life of Prescott, Higginson's History of the United States, Irving's Washington, Lives of Cicero, Hannibal, Cæsar, Xerxes, Alexander, Ferdinand and Isabella. Three boys were reading Dickens' History of England and one was enjoying Bancroft's ten volume History of the United

States, another had just read three volumes of Macaulay's Essays. Shakespeare, Bunyan, Bulwer, DeFoe, Jules Verne and Oliver Optic had one reader each. What Career?, Avis, Marble Fawn, History of Propellers, Management of Horses, Seven Oaks, Miss Mühlbach's Empress Josephine, Ways of the World, Half-Hour Natural Science Series, American Explorers, Little Men, Speke's Sources of the Nile, Wide Wide World, Waverly, Fortunes of Nigel and Quentin Durward were also named.

I invite our teachers to test their scholars in the same way during the present year, and to send me lists of the books read by their pupils. With the coöperation of teachers and school officers we may learn what the youth of Connecticut are reading. This effort will enlist the attention of parents and secure their aid in the selection of better books and periodicals for their children, and thus check a growing evil and accomplish great good. Teachers should foster a taste for such choice literature, that travels, histories and biographies, books of science, genuine poetry, essays and choice romances shall take the place of the "blood and thunder" stories and other emphatically *weekly* novelettes of the day.

Social reading should also be encouraged. The industry in many a sewing circle has been enlivened by well selected reading by one of their number. The same genial influence should often cheer the circle around the family hearth. "Reading circles" ought to be maintained in every town, where selections in prose or poetry, often a play of Shakespeare, the several parts having been previously assigned, and made the subject of careful private study and drill, are rehearsed together. These Reading Clubs, where each thoroughly studies his part or selection till he becomes so possessed of its thought and spirit as to render it in the best style he can command, not only cultivate the art of elocution, but improve the taste and develop a higher appreciation of the best authors. Aside from the educational value of this class of evening schools, their social influence is happy. Divided as the residents of our rural districts too often are, by party or sect, by prejudice or neighborhood difficulties, every influence tending to fraternize the people should be welcomed; every association where they meet on common ground for mutual improvement, and where kindly feeling and social amenities are cultivated, should be encouraged.

The teacher cannot awaken love of books unless he himself continues to be a student. Any one who thinks he knows enough to teach even the humblest class, should never profane the school room by his presence. One who has ceased to be a learner cannot be a good teacher. The more one has discovered, the more he wants to know. The truly learned man feels the greatness of his ignorance and the littleness of his knowledge as but a drop out of the boundless ocean of truth. It has been well said, "the greater the circle of our knowledge, the greater the horizon of ignorance that bounds it. The pride of wisdom therefore is the proof of folly." Arrogance and assurance are not the fruits of true learning. Yet from the days of Johnson to Dickens "the school master" has been characterized in our literature as magisterial, opinionated and dogmatical. Associated as teachers are with beginners, or at least inferiors in attainments, seldom called to the grapple of mind with mind as in forensic contests with equals or superiors, there is great danger of imbibing the spirit of conceit and dogmatism, even when only getting deeper in the old ruts. What is dryer than an old, opinionated, self-satisfied, unprogressive school master? He despises "all your new-fangled notions." He glories in the "good old ways." His fluent routine feeds his complacency, though it really enervates his own mind and stupefies his pupils. Whoever either in the college or primary school has ceased to learn, should by all means stop teaching, for children need impulse even more than instruction. Any one who no longer thirsts for higher knowledge, cannot fitly lead even the youngest to its fountain. As a teacher, one must be progressive, or cease to be at all. The mind that stagnates must soon retrograde, and such a teacher would stultify rather than stimulate his class. Happily there are now many teachers worthy of their work, whose ideal is high, and who are enthusiastic in the life-long work of personal culture. The efficient coöperation of such teachers I confidently anticipate in the efforts now making to stimulate a taste for books, and aiding our youth in the selection of the best books. One who early acquires a taste for reading and a love of books, will realize that his education is only begun when his school days are ended. To complete it will be the aim and ambition of his life. Let his calling be what it may, with an insatiable desire for knowledge, he will find leisure for self-improvement. The many instances of self-educated men whose eminence and success are due to an early taste for reading, should be given to the boys who are just entering the active pursuits of life, and who are so apt to think that they can no longer find time for self-culture. But is the little leisure they have well improved? Should the evenings be idled away, because the days must be occupied with business or labor? The youth whose teachers have trained them to always have a good book at hand for odd moments, will enter the practical callings of life with a habit of inestimable importance.

COMPULSORY EDUCATION IN ENGLAND.

My observations during the last year, both at home and abroad, refute the old objection to obligatory education, that "the laboring classes won't stand it." In the County and State Conventions of the Labor Unions recently held in Connecticut, resolutions have been adopted in favor of the rigid enforcement of the law for the prevention of illiteracy. Mixing much with the laboring classes for the purpose of promoting school attendance, I have been greatly encouraged by their growing appreciation of education, whether Americans, Germans, Swedes or Irish. In England the various labor organizations earnestly advocate compulsory education. The opposition comes from the comparatively few land-holders, the politicians and large farmers. In Glasgow, where the coercive regime is in full vigor, but fifty-one penalties have been inflicted in three years. In Birmingham, where the proportion of illiteracy was far larger than in Glasgow, greater exertions have been requisite to vanquish the apathy of parents. In Scotland, education has long been well nigh universal, while the poorer classes in England and Wales were sunk in ignorance. Under the existing law, the regulation of attendance is left to the local School Boards. Recent interviews with prominent friends of education in England and Scotland, satisfied me that public sentiment is rapidly growing in favor of making compulsion universal in its application. I could learn of no signs of reaction in any town where it had been adopted, but was assured that in the School Boards of London, Glasgow, Manchester, Birmingham, Sheffield, Leeds, and many other large towns, there is not now left a single opponent to this plan. Throughout Britain experience has converted many objectors to friends.

Sir Charles Reed, President of the London School Board, gave me last summer some statements which happily illustrate the good influence of compulsory education in that great metropolis. The new system went into operation in 1871. The school census then taken enumerated 574,693 children of school age, and needing elementary education. For these children only 262,259 school places were at that time provided, and there were 312,434 more children than places. Over two hundred new school houses have been provided since that date, and now the Board Schools and Voluntary Schools have accommodations for 505,323. The compulsory law has worked with little friction and marked success. As a result, there has already been a very considerable reduction in the cost of juvenile crime and pauperism. The magistrates of London and the Commissioners of Police have all borne cordial testimony to the fact that there has been a great diminution of juvenile offenses, and that every gang of young thieves known to the police has been broken up. The Superintendent of the Holloway Prison says the juvenile criminals have yearly decreased, so that instead of 136 males and 21 females admitted in 1869, the numbers for the last year were only 28 males and no females. In 1871, Hon. W. E. Forster, the father of the new educational bill, said to me, "In America you can have little idea of our difficulty in dealing with these myriads of street Arabs in London, who are so degraded and ignorant that they and their parents alike can appreciate neither the evils of ignorance nor the advantages of education." One of the inspectors now says, "These street Arabs sit side by side with the sons of industrious citizens, and so healthful is the tone of the school that complaints are seldom heard. These schools are of the deepest interest and first importance, receiving children from indigent and neglected homes, and supplying all that perhaps they will ever obtain of moral training and cultivation in head and heart. No one can continue to visit these schools and notice the sad state of these children at the outset without observing the gradual ameliorating effects of the care bestowed upon them."

By invitation of Sir Charles Reed, I witnessed in July last, the gathering of 5,000 of these children in Crystal Palace. The spectacle of so many children seated in ascending tiers in a semi-amphitheater near the great organ, was itself inspiring, and the grand choral singing, especially considering the brief period of their school attendance, was excellent. Besides the

5,000 singers, there was an enormous crowd of other children and their parents, the total number, said the President of the Board, was over 30,000. The Crystal Palace Company gave free admission to the children. Tom. Hughes, the President of the Company, made a speech of cordial welcome to all, and congratulated and commended the School Board that had already accomplished so noble a work. The main speech was given by Lord Sanden, a single sentence of which indicates the moral influence already exerted by the London schools. "When we think of the future of the children before us and of the various lots in life which will become theirs, it is impossible not to be deeply affected, or to look at these children without being grateful to Sir Charles Reed and his colleagues, for bringing these children into school, who might otherwise have been left in the streets, a plague to their parents and a danger hereafter to the State." Similar facts might be given as to the good influence of compulsory education in many other cities of England, and especially in Birmingham, the head-quarters of the National Educational League,—an association embracing such men as George Dixon, M. P., and Dr. R. W. Dale, — which has been active and influential in the advocacy of educational reforms. Visiting most of the schools of that city last summer, I gained ample proofs of the good effects of obligatory instruction, as there rigidly applied.

A striking conversion occurred in the case of the late Canon Kingsley. Though he long took a lively interest in the improvement of the working classes, an interest deepened by his service as government inspector of schools, he at first opposed obligatory education as un-English and offensive to the independent spirit of his countrymen. On finding that the working people favored compulsory attendance, his objections vanished.

A still more remarkable change has occurred in the views of Mr. Forster, the father of the Educational Act of 1870. He then opposed all efforts to make compulsion universal. Permission only was given to local Boards to adopt coërcion. Though convinced of the justness of this measure, he argued that the people are not prepared for it, and that outcries of "un-English," "arbitrary," "tyrannical," "invasion of one's home," "usurpation of parental rights," and all the easy claptrap of demagogues, would create a reaction, and therefore he did not ask for a general compulsory law. It was said, no matter what can be done in Prussia, or even in Switzerland, the people of England have too much independence, too much aversion to any semblance of tyranny, ever to submit to compulsory education. Mr. Forster now admits that he had no expectation that the town population would, to so great an extent, adopt the principle of compulsory education. Every town in England with 20,000 inhabitants, which has a School Board, has adopted it. The permissive provision for local compulsion was ingrafted in this bill with little faith that it would be ratified and applied in any of the large towns. But the people have surprised Parliament. In March last Mr. Forster said in the House of Commons: "Almost the entire *town* population of England is now under compulsory education. And there is no sign of reaction. If compulsion had worked with hardship on the people, nothing was so easy as to revert to the former state of things. If a motion were now made antagonistic to this principle of compulsion, *it would not have a single supporter in the School Boards of London, Manchester, Birmingham, or any other large town.* The school attendance in those towns where it has been made compulsory, has been improved 30 per cent. Leeds, for example, had almost solved the problem of getting hold of all the children. The attendance there has doubled by compulsion. The same has been done at Sheffield. At Stockport they had increased the average attendance until there were less than 2½ per cent. of the children between 5 and 15 who were not at school, and some of them were excusable on account of mental or physical inability. The right to compel a father to feed and clothe his child is admitted, and we have now arrived at a point of civilization at which we can declare that it is his duty to see that he is educated. The sole meaning of compulsion is that this is the duty of every parent, and that it is the business of the State to secure the performance of that duty, and if the parent is disabled by poverty, then to help him from local rates or imperial funds. It has been said, we must wait for public opinion. Well, public opinion has declared itself, for every town that by law was able to do so, has put the compulsory system in force. The fact is, that the arguments in favor of compulsion are overwhelming, and Parliament should now make compulsion universal. It is admitted, you cannot extend compulsion without producing some hardship, and bringing a bitter pinch to some poor widow who depended on her children's labor. No great reform can be effected without cases of individual hardship, but in the long run these alterations would be productive of magnificent results for the whole population."

In Connecticut, the State Board of Education invite the coöperation of all parents and school officers in their efforts to promote the observance of the law for obligatory education. The gain in school attendance since the adoption of our compulsory law shows the wisdom and value of the enactment. This law has met the sanction of the people, irrespective of party or sect. The Labor Unions, convinced that it is specially fitted to promote the interests of the working classes, have repeatedly passed resolutions in favor of its rigid enforcement. Many poor parents have learned that their ignorance is one cause of their poverty and that, as education is essential to thrift and prosperity, ignorance should not be allowed to perpetuate indigence. We use the right to enforce mainly as an argument to persuade—an authoritative appeal to parental pride and foresight. We so press the advantages of education that attendance may be held a privilege rather than a legal necessity.

But when reason and persuasion fail, coercion stands in their stead. The law protects helpless childhood whose rights are sacred. It recognizes the claims of the humblest child to an education, as that which the State cannot neglect without detriment to itself and harm to a human soul. Not even by omission may the State doom a single child to ignorance and its manifold evils. The temporary hardships to families by loss of children's wages, occasionally incident to the observance of this law, will be counterbalanced a thousand fold by the permanent benefit of both parents and children, while its neglect would inflict lasting evil upon them and the whole community.

Attendance upon an evening school merely, or irregular instruction at home does not meet the demands of the law, which given.

Our law in regard to non-attendance applies not to manufacturers only, but to merchants, mechanics, farmers and all employers of children. The manufacturers, as a rule, cheerfully comply with the law. There is need of watchfulness in reference to the larger number who each employ one or more children in shops, or stores, on the farm or in the family. All persons who know of any instance of the employment of children under fourteen years of age, who have not attended school the time required by law, are requested to send information of such fact to the office of the State Board of Education, giving the names and location of the employers of the children and of the parents. A journey to the remotest part of the State will be amply compensated, if, thereby, a single child can be brought to school.

The needs of neglected children still occupy much time in public addresses and personal labors. The good results already accomplished furnish ample encouragement for the vigorous prosecution of this work. During the last year the agent of the Board has visited a larger number of families than in any former year. As the result of these visits to the homes of neglected children, nearly three hundred such children have been led to attend school. Nearly ninety-five per cent. of our children are now reported as in schools of all kinds—a larger percentage than in any other State in America, when the basis of enumeration is taken into account. In Connecticut, the enumeration includes all children between four and sixteen years of age. The gift from the State Treasury and School Fund of about two dollars and a half per scholar, ensures the fullest returns. In Massachusetts the enumeration is from five to fifteen. We discourage attendance under five, and the law authorizes towns to exclude all under five. There is, therefore, reason for congratulation on the efficient working of our compulsory law.

SCHOOLS AND COMMUNISM.

In 1868 a prominent plea against Free Schools was the argument that "the system is communistic in its principle and tendency. Establish free schools and you encourage a demand for free food, free clothes, free shoes, and free homes." Professor Faucett, liberal, fair and progressive as he is, urged the same objection in Parliament, saying, during the discussion of the new "Elementary Education Act," which was passed in 1870, "If the demand for free schools were not resisted, encouragement would be given to Socialism in its most baneful form."

Time tests all theories better than arguments. In Connecticut a decade of free schools has witnessed no new tendencies to Communism. The general intelligence of New England was one obvious cause of its exemption from the communistic railway conflicts in the summer of 1877. The sober second thought prevailed here, while madness ruled the hour elsewhere. The last election in Connecticut showed plainly the popular dread of the socialistic tendencies and dogmas, which were repudiated by both the leading political parties. In Massachusetts, where free schools have been maintained for more than two hundred years, there is as little Socialism as in any land in the world. Indeed, throughout New England, there is no tendency to Communism among the descendants of the genuine New England stock. The minimum that exists is limited to a small portion of the foreign element. Though curiosity attracted crowds to hear Dennis Kearney last autumn, it is due to free schools and the consequent intelligence of the people, that his communistic tirades disgusted all classes and prompted the candidate who first sought his alliance to disown his dogmas and disfellowship him.

I find among all classes, employers and employés, in the factories and on the farms, a growing distrust, not to say detestation, of Communism. The mad outcry of the Internationals, "Equality of conditions," "Capital is the enemy of labor," finds no response from the intelligent laborers of Connecticut. Thanks to our schools, they know that the condition of the operative improves with the increase of industrial capital, which always befriends labor, when it multiplies the opportunities of education and profitable employment. Nothing helps the laborer more than that education which gives him both the desire and the power to better his condition, to improve first himself and then his home and household.

As a precaution against the communistic tendencies which now agitate and alarm Germany and other portions of Europe, and find here their fiercest advocates among the refugees thence escaped to our shores, the general principles underlying this subject should be studied by our teachers and presented in oral lessons in our schools. A few simple school talks on this theme might forestall much mischief in coming years. The intelligent workmen who by industry and economy are enabled to own their homes, however humble, or indeed to own anything, cannot be fooled by that insane crusade against capital, which really means wages without work, or which lets the lazy and profligate share equally with the industrious and frugal. The equality of conditions of which they dream, would be the low level of a common barbarism. Even enforced equality of wages lessens the motives to industry, skill and fidelity, and restrains the freedom of competition. Once applied, these notions would destroy not only capital but the motives and means of its future increase and protection. Destroy capital, and labor would suffer first and most. Capital and labor, therefore, are not enemies. It is only ignorance and prejudice that find any necessary opposition between the two. There should be kindness and sympathy between the employer and the employed. There need be no alienation between the rich and the poor. There should be no tyranny of capital over labor, nor hostility of labor to capital. The capitalist should fully understand the trials of the laborer's lot, and strive to ameliorate his condition, and the operative should know the risks, anxieties and conditions of success on the part of the manufacturer. There should be liberal pay on the one side, and fair profits on the other. The interests of both classes are bound together. If either one is harmed, the other must ultimately suffer. Certainly the laborer cannot long suffer in health, education or pay, without harm to the employer, and large losses to employers inevitably extend to the operatives. They are copartners, and cannot afford to be antagonists. Capital is as dependent on labor as labor is on capital, and only as both work in harmony, can the highest good of each be secured. Indeed, labor is both superior and prior to capital, and alone originally produces capital. Many a penniless laborer, because well educated, frugal and industrious, has become an independent capitalist. Our most successful manufacturers have toiled up from penury to affluence. This aspiration may stimulate every one who is educated enough to combine skill with labor.

Communism is an exotic in this land. It does not easily take root in our soil, and the climate is uncongenial. Its chief advocates are homeless foreigners, even the immigrants long resident here have become so schooled by public sentiment and by our free institutions, as to be well nigh assimilated and Americanized.

Schools and the diffusion of property are our safeguards against Socialistic extremes. John Adams well said, "The ownership of land is essential to industrial thrift and to national security and strength and prosperity." Switzerland, with institutions as free as ours, is safe from Communism, for two reasons—the maintenance of free schools, and the general ownership of land. The Internationals may meet in free Switzerland, and nobody is frightened or disturbed by their vagaries. Germany has education, but not an equal distribution of land. Her vast standing army, consuming without producing, with its enormous expenses and exactions, has created a great revulsion of feeling among the people. The glory of conquest and the untold milliards of the French indemnity mainly expended on new fortifications and military equipments, do not atone for the mourning and bereavement brought to so many now desolate homes, the heavy burden of taxation, the dread of conscription, the fear of new complications and wars, and the inexorable demand that every boy shall spend three weary years of service in the camp. Myriads of families with boys approaching the military age, have emigrated to other lands to escape this dreaded conscription.

In France the home of Communism has always been in Paris. The horrors of the Commune in 1871 proved suicidal to the system. Even Paris learned then a lesson not likely to be forgotten. But the great body of the French people, even then, had little sympathy with communistic doctrines, and to-day the French nation, with her 5,000,000 of land-owners, is strongly the other way. Here lie her strength and security. To illustrate the happy influence of this wide diffusion of landed property, Michelet describes a French peasant walking out of a Sunday, in his clean linen and unsoiled blouse, surveying fondly his little farm. His face is illumined as he thinks these acres are his own, from the surface of the globe to its center, and that the air is his own from the surface up to the seventh heaven. He is there alone—not at work, not to keep off interlopers, but solely to enjoy the feeling of ownership, and to look upon himself as a member of responsible society. Thus in all lands and among all peoples, "the magic of property turns sand into gold."

In the United States there are nearly 3,000,000 farmers with farms, averaging 153 acres each, besides a large number who own their dwellings and house-lots. These form the grand army of the Republic—each a volunteer, equipped and ready to strike down Communism, wherever its hydra head may appear. Let even the Socialistic leaders, whom Bismarck has banished, once learn here to till their own acres, and they will be converted to the true faith—of the sacred rights of property.

SCHOOLS AND PAUPERISM.

Ten years ago strenuous objections were made to free schools, as being a charity tending to pauperize the people, a kind of alms that no man could accept without impairing his manliness and self-respect. But they are now recognized as the people's schools by right, not favor, and prized as never before. Instead of being a charity, tending to demean and pauperize its recipients, all find themselves recognized as equal partners in the concern, having an equal voice in selecting the managers, in raising the funds, or in criticising the methods adopted. Thus the school is no more a charity than is the free public road or bridge. Help in schooling is really help towards doing without help—towards self-reliance. In Europe, those who express the greatest apprehension that the independence of the working classes would be destroyed by free schools, evince little desire to develop that genuine independence which true education fosters. In lands where the insolence of office is proverbial, they make it a prominent lesson to every child to "order himself reverently and lowly to all his betters, and to submit to the humors of my Lords." The people whose "independence" is so carefully guarded, are kept under various petty and vexatious restraints. Says Francis Adams, one of the most earnest advocates of free schools in Great Britain, "There is a large class in England, from whom we hear most about preserving the independence of the poor, who have always been opposed to measures intended to enlarge popular freedom. They find a personal gratification in the exercise of petty charity and the power to deal out to the working-classes little doles such as are provided for the remission and payment of school fees. Notwithstanding their homilies about parental independence and responsibility, they possess the spirit of patronage so long fostered by the social conditions of the country, which has done much to keep so many of our people in a state of miserable dependence and subjection. When their system of alms-giving can be carried on at the public expense, their zest is no doubt greater and they will not willingly surrender any power which still has force to pluck 'the slavish hat from the villager's head.' This class now stands in the way of the complete realization of the free school system in England."

The vast pauperism of England, especially among the farm laborers, is largely due to the want of free schools. The facts and figures, both in regard to illiteracy and pauperism are appalling. The saddest sight to me in England strangely contrasted with her glories and beauties many and great, of which every Englishman is justly proud, was the low and wretched condition of her illiterate masses. Lest any just statement from an alien may seem exaggerated, I will quote from those to the manor born, for these facts from the lips of Englishmen, prove the evils of ignorance, if not the value of universal education. Rev. Dr. J. H. Riggs of London, who, in his zeal to prove our free schools a failure, quotes my description* of a few of our worst school-houses and poorest district schools, as if they were of *general* significance, and proclaims that ten weeks serves for the training of teachers in the Normal School of Connecticut, and that some of the schools of Maine are kept open but three or four weeks in the year, with kindred exaggerations and caricatures, unworthy of reply, and who finds almost everything English superior to anything American, is compelled to say, "English pauperism is a problem and a portent which seldom makes a due impression on an Englishman. Its monstrous character and dimensions are so familiar to us that they seldom strike us as monstrous. This vast and complex evil, this ulcer in the body politic, in its character and extent in this country, is absolutely a unique fact, because there is nothing comparable with it in the world besides. The number of persons annually in receipt of pauper relief is upwards of a million. The annual cost of poor relief is £7,886,724 (nearly $40,000,000). Abjectness and recklessness form the main element of the pauper's home. His cottage may consist of three rooms—the common room filled with litter and discomfort, and two bed rooms for all the inmates, parents and children, lads and lasses and often a male lodger, so that neatness and decency are precluded. Too often the cottage is even worse, a wretched double cell, where penury cowers, chastity can hardly survive, and female delicacy must be unknown, the house only a shelter, full of cumber and litter. Such are the homes of the majority of our English peasantry in the southern, western and south middle districts, and of many in most parts of England and in wide districts of Scotland and Wales. Such is the condition of the pauperized peasants, not as poets have painted, England's glory, but her reproach." Rev. James Martineau says: "The social discrepancies which disfigure and affect society have here assumed a monstrous and fearful character. Our country is a vast congeries of exaggerations. Enormous wealth and saddest poverty, sumptuous idleness and unrewarded toil, princely provision for learning and the most degrading ignorance, a large amount of laborious philanthropy but a larger of unconquered misery and sin terrify us with their dreadful contrasts of light and shade. It is appalling to think of the moral cost by which England has become materially great. Where is the laborer by whose hand the soil has been tilled? In a cabin, with his children, where the domestic decencies cannot be. I know not which is the most heathenish, the guilty negligence of our lofty men, or the fearful degradation of the low."

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* As found in several Reports of the Board of Education.

John Bright says: "Fearful suffering exists among the rural laborers in almost every part of this kingdom. What wretched, uncared for, untaught brutes, in helpless stolid ignorance, are the people who raise the crops on which we live, and what dirt, vice and misery in the houses where seven or eight persons of both sexes are penned up together in one rickety, foul, vermin-haunted bed-room—their wages reduced to the very lowest point at which their lives can be kept in them! They are heart-broken, spirit-broken, despairing men—reduced to such brutality, recklessness, audacity of vice and extreme helplessness that they have no aspirations to better their condition. Accustomed to this from their youth, they can see nothing in the future which can afford them a single ray of hope. As the rural laborer looks longingly up the social ladder of ranks, the first six or eight steps are broken out, and there seems to him no chance to span the chasm."

J. Scott Russell said ten years ago, "Something must be done, or our working classes will be grievously wronged and the whole nation suffer. Poor England, standing by idle, is too late. Her workingmen, grown up uneducated, cannot now be educated, are too old to learn. They have lost a generation. Where was the fault? where the blame?. Why did not our statesmen and aristocracy, already provided with special universities and schools for their own training, foresee that our trade was going away to more skilled nations, and warn us in time? The contrast between England and Switzerland is this; England spends more than five times as much on pauperism and crime as she does on education, and Switzerland spends seven times as much on education as she does on pauperism and crime."

It was in view of startling facts and statements like these from her own countrymen that England organized in 1870 an efficient system of public education. It is a striking fact that the latest statistics show a great diminution of both pauperism and crime. Instead of a million of paupers in 1870, the number returned January, 1878, was 726,000.* The cost of juvenile crime and pauperism has been remarkably reduced. The London Police Commissioners testify to a great diminution of juvenile offences and affirm that every gang of juvenile thieves known to them has been broken up. Even the adult population has been reached and elevated in some degree through their children. New hope and ambition have come to many an illiterate farm laborer, himself born to despair, by reason of ignorance born to helplessness and hopelessness, as he finds, though a thing unknown and undreamed of before, *his* children at school, and hence sees dawning upon them better prospects and possibilities than ever fell to his hard lot. The hopes cherished for children have thus cheered many a humble cottage.

In striking contrast to the depressed condition of the farm laborer in his own land it is interesting to see the picture of the New England farmer drawn by Rev. Dr. R. W. Dale, of Birmingham, in an address at Canonbury, England, January 17, 1879. When traveling in this country, he frequently expressed his surprise and admiration in view of the intelligence and independence of the farmers of New England.

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* The unprecedented financial embarrassments now experienced in England will no doubt swell the next returns.

After remarking that for a century and a half the Puritan colonists had been left practically undisturbed by any foreign element, Mr. Dale proceeded to speak of the type of character which had been developed in New England and of the present social condition of the people. "From the 21,000 persons who, after five generations, were found in those States, descendants numbering at least four millions might be reckoned. At the present moment *no population on the face of the earth enjoyed equal prosperity. Wealth was more equally distributed than in any other community;* and the real and personal estate, liable to assessment, now averaged nearly £240 per head for the inhabitants, or £1,150 for each family, reckoning the family at five persons. The New England farmer had from the first adopted the belief that *the way to fight the devil was by the school and the church*, and that belief had been thoroughly and consistently acted upon. The influence of this vigorous race upon the United States, as a whole, had been immense. It was they who had been the great pioneers in the development of the resources of the country. It was they, chiefly, who had built Chicago, and who rebuilt it, after it had been destroyed by fire, with a quickness and splendor which rivalled the achievements described in the pages of romance. From the farm houses of New England had sprung many of America's noblest orators, most learned theologians, and greatest statesmen and philanthropists, and in the future the same people would contribute largely to the stability and greatness of their country. The history of these colonies, as contrasted with the history of other colonies, was an illustration of the true path of national greatness."

This remarkable contrast between the farm laborers of England and New England as described by English writers furnishes a demonstration of the economy and value of the school system so long neglected there and maintained here. The earnest appeals of Joseph Arch, John Bright, Dr. Dale and others in behalf of the farm laborers of England, have awakened general sympathy, advanced their wages, and ameliorated their condition.

NATIONAL SCHOOLS.

" Americans have no *National* System of Education," is the slur one often hears in Europe. To this criticism, my ready answer was, we need none and are fully determined to have none. The maintenance and control of schools has never been the aim of our National Government.

Our local independence and repugnance to federal interference and our complete State sovereignty in educational matters, is an enigma to Europeans, being in marked contrast to their traditions and usages. In England, for example, the School Board of any town or city may not select a site, build a school house, or prescribe the amount of a school fee without the sanction of the National Educational Department. But the complete decentralization of the American school system, though a point of weakness in European eyes, is, in fact, a prime source of its strength. The fact that our Schools are wholly in the hands of the people, supported by the funds they raise, controlled by officers chosen by them and responsible to them, is a leading element of their prosperity. Though certain bills lately introduced into Congress indicate that a few would welcome European centralization and control, the general public sentiment of the country has so long been growing in favor of the unfettered working of State systems, that this has now become our settled policy, which no lobby in Washington can change if it would, and should not if it could.

If a strong central government be essential for an ignorant nation, an intelligent people can govern themselves. In America, the success of schools in each State will depend upon the intelligence and consequent appreciation of its people. One of the worst legacies left by slavery is that of ignorance, and consequent indifference to schools, or rather of insensibility to the evils of illiteracy or to the advantages of education. Shall the admitted school destitution of the South, or of some new Western States, be promptly removed by federal agency, or more gradually supplanted by developing a proper local public sentiment. In the past, states and nations have been slow in learning the lesson that alike to individuals and peoples, ignorance means waste and weakness, if not pauperism and crime, and that education tends to economy, thrift and virtue.

But there is a great acceleration in the working of moral and intellectual forces so that now in a decade, sometimes in a single year, are accomplished broader results than formerly in a century. The day for coërcion and dictation is passing. The growing assimilation and power of public sentiment is felt the world over. It has broken down the walls of China, the isolation of Japan, the serfdom of Russia, the slavery of America, and is now rapidly relaxing the grasp of tyranny even in that center of oriental despotism, Turkey. But nowhere else is public sentiment so supreme in its influence as in America, and never before has that sentiment been so strong in favor of the support of free public schools as to-day.

A striking illustration, both of the difference and power of public sentiment, was furnished more than a century ago by the replies sent by two American colonies to questions put by the English Commissioners for Foreign Plantations. The Governor of Virginia replied, "I thank God we have no free schools or printing presses, and I hope we shall not have these hundred years." The Governor of Connecticut answered, "One-fourth the annual revenues of the Colony is laid out in maintaining free schools for the education of our children." Accordingly, till after the late civil war, Virginia had no general public school system. Thomas Jefferson prepared with his own hand a bill for a free school system, of which he said, "By this bill, the people will be qualified to understand their rights and to maintain them, and to exercise with intelligence their parts in self-government. Provided for all children alike, rich and poor, the expenses of these schools will be borne by the inhabitants of each county, in proportion to their general tax-rates, and all this will be effected without the violation of a single natural right of any individual citizen." Jefferson caused the words, "Founder of the University" to be inscribed on his tombstone, but he placed a far higher estimate on free schools than on "superior education." Though defeated in this cherished plan, he defended it to the last, and said shortly before his death, "Were it necessary to give up either the Primaries, or the University, I would rather abandon the last, because it is safer to have a whole people respectably enlightened, than a few in a high state of science, and the many in ignorance. The advantages of popular education are above all estimate. The objects should be to give every citizen the information he needs for the transaction of his own business, enabling him to calculate for himself and express and preserve his ideas, his contracts and accounts in writing; to improve by reading, his morals and his faculties; to understand his duties to his neighbor and country, and to discharge with competence the functions confided to him by either; to know his rights and exercise with order and justice those he retains; to choose with discretion the fiduciary of those he delegates, and to notice their conduct with diligence, candor and judgment, and, in general, to observe with intelligence and faithfulness all his social relations. All the States but our own are sensible that knowledge is power. We are sinking into the barbarism of our Indian aborigines, and expect, like them, to oppose by ignorance the overwhelming mass of light and science by which we shall be surrounded. Surely Governor Clinton's display of the gigantic efforts of New York in education, will stimulate the pride as well as the patriotism of our Legislature to look to the reputation and safety of their own State, to rescue it from the degradation of becoming the Barbary of the Union and of falling into the ranks of our own negroes. To that condition it is fast sinking." How different would have been the history of Virginia had she heeded the wise counsel of this, her most eminent and far-seeing statesman? To the lasting harm of that State a different sentiment prevailed, so that as late as 1860, a leading Virginia paper said, "We have got to hating everything with the prefix *free*, from free negroes down and up through the whole catalogue, free farms, free labor, free society, free will, free thinking, free children and FREE SCHOOLS—all belonging to the same brood of damnable sins. But the worst of all these abominations is the modern system of free schools. The New England system of free schools has been the prolific source of the infidelities and treasons that have turned her cities into Sodoms and Gomorrahs, and her land into the common nestling place of howling Bedlamites. We abominate the system, because the schools are free." The long neglect of public schools so manifestly checked the growth and prosperity of the Old Dominion, notwithstanding her vast natural resources, and created so marked a contrast between her and other States far less favored in all the elements of material prosperity, that the logic of events has at last swept away these objections and converted old opponents to friends and supporters of free schools. At length Virginia rejoices in a free public school system. The progress of her public schools since the war is remarkable, accomplished in the face of prejudice, ignorance, and great financial embarrassments, for Virginia had her full share in the loss of over "three thousand millions of dollars sunk by the Southern States by the war," an amount larger than all the property of New England. To the question, How can schools be organized for the Southern States, without Federal aid or interference? the answer is, Look at Virginia, especially the schools of Richmond, Petersburg, Lynchburg, Staunton and Norfolk. Public sentiment there has been revolutionized. The common schools are growing in favor. Prejudice, opposition and penuriousness of course still exist, but are evidently waning. I inspected most of the schools of Richmond with as much delight as surprise, alike in view of the interest of the pupils, the culture of the teachers and the excellence of the schools. Private schools have greatly diminished and the children of the rich generally attend the public schools. Considered as the growth of eight years, the Virginia system is a most gratifying work. In the light of such facts, and in view of the rapid working of intellectual forces in this age and country, and the growing power of public sentiment, shall the most illiterate portions of our land be reached by *National* Schools supported by National aid and in any way controlled by a National Department? Shall the National Bureau of Education become a Federal Department, enlarged and authorized to organize and maintain a National University—or, with still greater expansion, empowered to establish schools and distribute the income from the sale of public lands, whether in proportion to existing illiteracy, school attendance, or the length and grade of the schools maintained?

Hitherto the National Bureau of Education has been simply advisory. It has, and it was intended to have, no authority. As an agency for collecting and disseminating needful information, it has already done great good, and promises to be still more useful in the future. But the attempt to organize a National University, support and direct local schools, or in any way interfere with State systems, would end its usefulness, if not end itself. Every true friend of this Bureau should protest against any such "enlargement of the field of its operations." The principle of State independence is too firmly fixed in the faith of all classes to brook any federal interference in school matters, even in the States or Territories most destitute and backward in education. In an ill-conditioned community like that in New Mexico for example, still Mexican in their traditions, sentiments and peoples, juxtaposed, but not blended with the heterogeneous elements of a swarming immigration from all parts of the country, not to say of the world, American ideas and institutions are yet in their rudimentary forms and earlier stages of development. Shall a Federal Bureau, at once in European style, *enforce* there its best plans of public schools, or leave them by a slower, surer, and more healthful process, to work out their own salvation? As the schools of every community answer to local public opinion, their success must depend on the sympathy and appreciation of the people. Public sentiment is a growth, not the creature of power made to order of any sort or size, as some have talked of "fiat money."

DECENNARY OF FREE SCHOOLS.

The free school system of Connecticut has now had a trial of ten years and is no longer an experiment. This "new law" was so radical in its character as to meet general opposition when first proposed in 1867. During the next year there was so great a change in public sentiment that it was enacted with great unanimity by the General Assembly of 1868. The struggle which this system had to wage for its existence is over, for it has been amply ratified by the people. The gauge of public interest is the increased burden of taxation which the people of Connecticut have chosen to bear, for school taxes are self-imposed. The amount raised by taxation for schools ten years ago was $628,152.12. The amount raised by State, town and district taxation last year was $1,252,248.63, or about double the amount reported in 1868.

The enemies of free schools have either been converted or learned the futility of open opposition. Dissentients are still found whose sympathy is needed to give the highest efficiency to the system. As the condition of the schools in each district answers largely to local public sentiment, the coöperation of every parent and citizen is essential to the fullest success.

A brief review of the history and results of the free school system furnishes encouragement to its friends, and presents facts fitted to satisfy the minds of all honest doubters. Convinced that the rate-bill was wrong in principle and harmful in practice I directed my earliest efforts, on entering the service of the State, to secure its repeal. During the session of the Legislature for 1867, the Joint Standing Committee on Education finally consented to recommend a bill for free schools, though with little faith in the measure and no expectation of carrying it. As the bill met no favor in either House, out of courtesy to its author, it was referred to the next General Assembly. During the next year the subject was fully discussed in numerous meetings in all parts of the State, the Secretary giving two hundred and six lectures on this and kindred topics.

Many sincere friends of education, deprecating these efforts, gave faithful warning as to their certain failure. The subject was freely discussed also in the press, and brought very prominently before the people. The sentiment was widely proclaimed that it is the duty and interest of the State to furnish substantially equal common school privileges to the children of all classes. Self-protection was claimed to be the right of the government. For this purpose it maintains armies and navies. But safer and better every way than forts and fleets, indispensable as they may be, better for its peace and security, its prosperity and protection, is universal education.

Comparatively few now press the objection which was widely urged ten years ago, viz: "It is unjust to tax me for the education of other people's children. I have none. Let those who have, pay the cost of their schooling." This objection is founded on a false theory of government. The State justly claims a right to its citizens for its defense, a right to lay its equal and needful claim on their property, time and service. For the achievement of our independence, and more recently for the preservation of our institutions, how many were called to endure toil, hardship and death. This claim of the State involves the correlative truth that the State has duties as well as rights, and foremost among them is the duty of securing a good common school education to the children of all classes.

The right of a State to support free schools is little else than its right to defend itself by a humanizing and civilizing education against what otherwise would become a degraded and dangerous class in society. The right of a free State to self-existence implies the right to maintain free schools, essential as they are to its preservation and prosperity. Education is the cheapest police agency a State can employ. In a wisely administered government, educational taxes are the fares which we pay on railroad cars, the price for being safely carried and well provided for, through the journey of life. These taxes are founded primarily not on the idea of benefiting parents and children, but the broader view, that the State has a proprietary interest in all persons and property within its bounds and especially has a stake in her youth that they may be well qualified for her service, whether that shall be on the farm, in the factory, in the counting room or in the field of arms. It was really the better education of the North that saved the Union during the late civil war, as it was the ignorance of the "poor white trash" making them the dupes of demagogues that rendered the rebellion possible in the South.

In 1868 Governor English exerted his influence strongly in favor of free schools. In his annual message to the Legislature he said: "The rate-bill should be abolished and the schools sustained at the common expense." In his parting address to the General Assembly of that year he said: "The measures which you have adopted to promote the interests of the people will meet with a generous approval at their hands. Especially will they thank you for the interest you have taken in the common schools. In adopting the free school system recommended in my annual message, I am confident you have taken an important step forward in the cause of education, and that your action in this regard will prove as beneficial in results as the motives which prompted it were free from political influence or bias."

As Governor English intimates, this new law was not in any wise a party measure. That a measure so radical should pass unanimously in the Senate and with only four nays in the House was more than its most sanguine friends expected. The press of the State was a unit in its favor. The leading men of both parties were its advocates. It is fortunate that on educational questions, men of all parties and all religious denominations meet on common ground and cordially coöperate for the common good. The platforms and creeds, which divide men outside, should never enter the common school—*common* because open to all, free to all; where no class distinctions are recognized and no favoritism is shown.

The law has received an emphatic ratification from the people. Two years later, when its influence in increasing taxation had been fully felt, an earnest effort was made in the Legislature for its repeal, which signally failed. Opposition and discussion helped this measure, as they always do any other which can bear close scrutiny and stand the test of experience. When the proof was placed before the people that thousands of children had been barred from school by the rate-bill, it was generally admitted that the results already attained proved the wisdom and necessity of the free system.

The Democratic State Convention, held in Hartford, January 17, 1871, unanimously adopted the following comprehensive resolution:

> "*Resolved*, That the source of power being in the people, Free Schools and general education are essential to good government and the perpetuation of free Institutions."

The Republican State Convention, held in New Haven one week later, adopted a resolution equally strong in favor of free schools. Since that date, no opposition to the measure has been made or intimated in the Legislature. The subject of free schools was ably discussed by School Visitors in their Reports to their several towns. To give a single illustration of the strong and practical way this subject was brought home to the people in local reports in 1873, the able Report for Litchfield, written by Governor Andrews, then Secretary of the Board of School Visitors, said: "The argument in favor of free schools is short and decisive. Every person recognizes the duty of society to protect the *lives* of children. Our law protects the lives even of children unborn, for the reason that it is for the benefit of society that children should be born and reared. If, then, society may for its own benefit preserve the mere animal existence of a child, the obligation irresistibly follows that society must see to it that the life so preserved shall develop into a useful, intelligent and moral citizen, and not into a ruffian and a curse. The logic is impregnable; society should either destroy all children, or guide, protect and train them up to careful citizenship. Establish infanticide, or some system of free instruction. But the time for argument on the abstract question of free schools in our State is passed. As good citizens, we ought to use every effort that the system so inaugurated shall be successful."

In 1868, a leading objection to the system was its alleged tendency to lessen the interest and responsibility of parents. The natural argument was that men never value what costs them nothing. But the fact is, parents do pay, and all pay their fair and equal portion for the support of this central, public interest. The poor man who only pays a poll tax gives his share as truly as does the millionaire. The system has manifestly dignified the school in the esteem of both parents and pupils, and quickened the educational spirit of the whole people. Every tax-payer, having contributed his part to the support of the schools, feels that he has a right to look after his investment. The details of our public schools are better known to parents than are the plans of private schools to their patrons. As a result of free schools, the great majority of the town reports concur in saying: "There has been a decided advance in the number at school, in regularity of attendance, and in the manifest interest of the people." More than ever it is felt that the schools belong to the people. In patronizing them the poorest parent is proudly conscious he has no leave to ask, no patron to conciliate, and no alms to beg. Every body pays something and feels that it is a good investment, and one which justly entitles him to its advantages.

In the past ten years the increase in enumeration has been 14,757, while the increase in the number registered in *public* schools has been 20,438. The number in *private* schools was first reported nine years ago, and the increase in that time has been 1,526. If it be assumed that the number *ten* years since was the same as nine years ago,—which is very nearly correct,—then the increase in attendance in both public and private schools in the last ten years is 21,964, which exceeds the increase in enumeration by 7,207.

NEGLECTED CHILDREN.

This subject continues to claim attention. As the trend of the tide is here against us, to stem it requires constant watchfulness. Without effort, a backset would cover ground well nigh reclaimed. For, however well done, this is a work like that of a physician, that never stays done. Old cures will not stop the breaking out of new cases. In dealing with negligent parents our main reliance has still been kindness and persuasion, appeals to their parental love and pride, their sense of duty and their personal interest in view of the great importance of education to their children, and the rich privileges freely proffered them in the public schools. The same arguments have often reached the children, and thus they have gained a higher appreciation of the influence of the school upon their happiness, thrift and prosperity through life. Teachers as well as school officers may greatly help in this good work. It is the teacher's duty, or rather his privilege, to visit the parents of truant or neglected children, learn the causes of delinquency and secure parental coöperation. As I have urged this duty, a few teachers have asked substantially—"Is that in the bond," "what does the law demand?" as if the one ruling thought was—what is the minimum work I must do; but fortunately there are but few teachers whose theory and practice limit their duties and sympathies to the school house and school hours. On the other hand, a large proportion of our teachers, bent on doing the utmost good to their pupils, inquire into causes of absence from school, visit pupils in sickness, and thus often win the confidence and coöperation of parents otherwise captious or indifferent.

Among the causes of absenteeism is the want of proper clothing. In these hard times, while many willing hands are unable to find employment, this plea is by no means limited to the huts or haunts of indolence, intemperence and profligacy. Where parents are really too poor to provide comfortable clothing, the pressing needs of their children should enlist the sympathies of the benevolent. Here true charity may do as truly Christian work as by any gifts for missions in pagan lands. That charity which really begins at home is at once most comprehensive and diffusive. Poor children have often been thus provided that they might attend the Sabbath school, and this effort is worthy of all praise, but even for morality and piety, thirty hours a week in the public school is worth far more than one hour in the Sabbath school. In some towns the Selectmen have met this exigency. While great caution should be used not to encourage indolence and improvidence, there are cases of destitution where town aid may be used as wisely to prevent starving the mind as famishing the body.

The fact that nearly ninety-five per cent. of our children are reported as in schools of all kinds, shows that the law for the prevention of illiteracy has worked beneficently and opened to hundreds the door of the school house otherwise closed to them forever. The influx of the foreign element suggests the leading cause of absenteeism. Those who need the most watching are of alien parentage, as yet novices in the English language, speaking chiefly a foreign tongue. There is also a large class of *native* children, whose parents, being illiterate immigrants, do not yet appreciate the advantages of education.

But four parents have been prosecuted and fined during the year. Instead of brandishing the penalties of the law, we have kept them in the background, and urged mainly the great advantages of education. These persuasions are, however, sometimes enforced by the delicate hint that we desire to avoid the painful duty of prosecution which must follow any and every case of willful and open defiance of the law. As will be seen by the following report, the prosecution of the employer and three parents in one town, resulted in promptly bringing seventy children to school.

It was a very gratifying fact that the superintendent of one of the largest factories in the State, after being prosecuted for the employment of children who had not received the required schooling, and being bound over to the Superior Court, should have the manliness to write to the Agent of the Board: "The legal measures you took were right and proper, as you used every other means in your power, and the law as the last resort. From this time, you may be assured, I shall use my best efforts to comply with the law—and without the law, I think the parents would have defeated me in getting their children to school, but they now find that they are liable as well as myself, and I shall have their coöperation in bringing about the desired result. I shall be pleased to see you at any time, and have your advice and suggestions in regard to educating the children." The sincerity of this declaration was evinced by the order promptly given to the overseers, "enforce the law for the schooling of children, even if its observance should stop the mill." If this superintendent was the greatest sinner, he now bids fair to be the best saint in our "canon" of employers of children.

Whatever may be true in monarchical governments, in *our* country there is every motive to kindness and conciliation in the execution of this law. Our plan is truly democratic, for its entire management is by the people and for the people, through school officers chosen by the people and responsible to the people, and hence commands popular sympathy. It is not pressed upon the people by some higher power, but is their own work, embodying their judgment and preferences. The old form of compulsory education which existed in Connecticut for more than a hundred and fifty years was not forced upon the people as "subjects." It was rather a living organism, of which they as "sovereigns" proudly claimed the paternity, growing up with their growth and recognized as the source of their strength and prosperity. After the utmost use of kindness, tact, and persuasion, and every effort to awaken a dormant parental pride, and showing that education will promote their children's thrift and happiness through life, we find that such persuasions are the more effective when it is understood that the sanctions of the law might be employed. We have used the right to enforce mainly as an argument to persuade. As thus used, we know in Connecticut that our law has been a moral force. It is itself an effective advocate of education to the very class who need it most. It has already accomplished great good and brought into the schools many children who would otherwise have been absentees.

FRENCH VIEWS OF AMERICAN SCHOOLS.

In 1876, the French Government appointed F. Buisson with six assistants, to examine and report upon the American school system. The Commissioners were all educational experts, connected with the Department of Public Instruction. They made a careful inspection of the school exhibits at our Centennial Exposition, and visited schools in various states from Massachusetts to Missouri. Repeated interviews with Monsieur Buisson led me to expect a most valuable Report from an observer of such culture, breadth and judgment, aided as he was by such eminent associates. This expectation has been amply met. Professor Swinton,. who has translated a summary of this Report, fitly says: "We owe to a Frenchman the best statement of the philosophy of American politics. And now we shall have to credit to another Frenchman the best statement of the philosophy of American education. If this Report has not the monumental character of De Tocqueville's Democracy, it is by far the most comprehensive and the most valuable analysis thus far made of public instruction in the United States. It is our whole free school system, its organization, working, methods and results, set forth in its glories and in its faults, in its strength and in its weakness, by a critic as sympathetic as he is acute. By those who personally met the Commissioners, the Report of what they saw and what they thought of what they saw, has been awaited with lively interest. Well, we have at last after two years the *Compte rèndu* of their mission embodied in a great octavo of some 700 pages, published in Paris under the auspices of the French Ministry of Public Instruction. The mere outlay that must have attended the mission and the publication of so costly a volume, enriched with plates, plans, etc., is a marked compliment to American education."

In condensing the following statements so as to read freely, I have modified the language of the writer for the sake of brevity. If the rhetoric has suffered, the thought is retained.

A republican government needs the whole power of education, said Montesquieu. This sentiment never found a fitter illustration than in the United States. If any people ever used this "power of education," or united its destinies to the development of its schools, or made public instruction the supreme guarantee of its liberties, the condition of its prosperity, the safeguard of its institutions, that is most assuredly the people of the United States. This role assigned to the school in social life has long been the most characteristic feature which foreigners have observed in American customs. This solicitude for the education of youth grows with the growth of the country, enters more and more into public opinion, and is incorporated in more decisive acts. What in the beginning might seem a burst of enthusiasm has gradually assumed the force of a profound conviction. No longer the work of philanthropists, or of religious societies, it has become a public service for which states, cities and towns include in their ordinary taxes sums which no country in the world had hitherto thought of consecrating to education. So far from restricting itself to elementary education, this generosity extends so as to provide free institutions of superior secondary instruction. Public opinion approves, nay, enacts these sacrifices, so clear has it become to all eyes that the future of the American people will be what its schools make it.

Many causes conspire to give the American school this unique importance. At first it was the influence of the Protestant element. The early settlers of New England knew of no grander duty, or more precious privilege than reading the Bible. Holding ignorance to be barbarism, they early enacted that each town shall have a school and that each family shall instruct its children. In proportion as their government became democratic, that which at first was only a religious duty became also a political necessity. Where everything depends on the will of the people, that will must be enlightened, at the risk of utter ruin. Education, useful elsewhere, is here essential. Universal suffrage means universal education or demagogy.

This country is peopled by the constant immigration of men of every race, class, and religion, who have little in common but the desire to better their condition. The mixed and ignorant crowds who form the bulk of this immigration tend to group themselves according to their nationality. Hence they need to be Americanized as soon as possible. The Irish, German, French, Scandinavians and Spaniards must not desire to constitute themselves a nation in the nation, but these immigrants must themselves be the American nation and make their boast of it. What is the instrument of this marvellous transformation? What institution has so infused the American blood into these thousands of colonists, who have hardly had time to forget Europe? It is the public school, and its usefulness in this direction alone justifies its cost. Suppose that instead of these public institutions, the new immigrants could find only private schools, all would be changed. Each would follow his own ideas and customs, each group would constitute itself apart, perpetuating its language, traditions, creed, its ancient national spirit and also its own prejudices. Instead of accustoming the child to a healthful contact with conflicting opinions, the school would be a confessional, the distinction of rich and poor, of the child that pays and the charity pupil would perpetuate and pronounce itself. It is a capital fact for America, thanks to daily contact in the public schools, that the antipathy of the white to the colored child has begun to yield. And the United States without this fusion of races, without unity of language, without the equality of social classes, without the mutual tolerance of all the sects, above all, without the ardent love of their new country and its institutions, would that be the United States at all? All that this country has become and is now, is literally due to the public school.

In proportion as a nation advances, the dangers which the school is to avert go on increasing. For this reason they redouble their efforts and liberality for schools. As the native population does not increase as fast as the foreign or mixed population, the time may come when the American element, the native *Yankee*, will be in the minority. Hence the United States omit no measure fitted to imbue the new population with the American spirit and so assimilate them that they shall seize and make the national traditions their own.

The Profession of Teaching in the United States.—In France a person enters the career of teaching with the view of creating for himself a stable and permanent position. Those who abandon it before obtaining their retiring pension form the exception. The young beginner expects to live and die a teacher, and as each year adds to his previous experience, the time comes when, possessed of adequate theoretical and practical knowledge, he is able to discipline his class methodically and successfully.

Not at all thus is it in the United States. The profession of teacher seems to be a sort of intermediate stage in one's career —a stage at which the young woman awaits an establishment suited to her tastes, and the young man a more lucrative position. For many young people, this transitory profession simply furnishes the means of continuing their studies. Few male teachers remain more than five years in the service; and, if the lady teachers show a longer term, it is not to be forgotten that marriage is usually the end of their desires, and that, once married, they almost always resign their positions. It has thus come to pass, by the mere force of circumstances, that the school authorities have been led not only to establish various regulations for the application of school laws, but also to lay down detailed courses of study containing the subjects to be taught in each kind of school, in each class, often in each division, and this for each term, if not for each month in the year. The time-tables in schools that are at all regularly attended are fixed in advance, the text-books are chosen by the school board; and finally, school manuals, often of great value, are furnished as a *vade mecum*, from which teachers may derive information as to methods and the various details of daily work.

Time-Tables.—A class in an American public school, even in the cities, comprises at least three divisions or sections, and in some classes with not more than forty-five pupils, five sections are found. But while in France it is a principle not to go beyond three divisions, and to bring these together as frequently as possible in collective lessons, such as reading, writing, history, geography, object lessons, and dictation—whereby these exercises receive the amount of time required for some degree of fullness in the development of the subject,—the American system rarely admits a combination of this kind. Each division has its own separate lessons in the different branches, with an *occasional* exception in the case of oral spelling and object lessons. Thus in a session of two and one-half hours of actual work, we have counted in the primary schools and in the country schools as many as fourteen distinct exercises—a number reduced to seven in the grammar schools; but there is always one-half at least of the pupils that remain unemployed, while the others receive their lessons or go through their "recitation," as it is called in the United States. This everlasting coming and going of *study* and of *recitation* gives rise to a perpetual movement in the class-room.

Moreover, as monitors are never employed, it comes to pass that a very limited period of time can be given to the lessons, and even this time is diminished by the frequent changes of place, for generally, in recitation, the pupils leave their seats and arrange themselves standing, along the class-room wall, and then return to their seats during the fifteen minutes or half hour of "study," their place in the meantime being taken by others. In many a time-table we have seen lessons in reading, arithmetic and history reduced to ten and even to five minutes, and, in like manner, general lessons in botany and physiology cut down to five minutes in the first grade of a grammar school.

What is to be expected from such a procedure? It is in vain that the best arranged programmes are put into the hands of teachers, or that the most valuable pedagogic directions are laid down for their guidance—their intelligence and their devotion must both be foiled by the vices of such a system.

The time-tables—rarer, by the way, than any other documents—appear to us the weak part in the organization of American schools. There is nothing to indicate that most important matter, to wit, the work of those divisions which the teacher has not immediately in hand. The pupils are "studying," they told us, but what are they studying? Undirected and unwatched, we have our fears as to this "studying." Of course, there must be a great abuse of copying work, that mechanical task so justly proscribed in France; and worse still, it cannot be possible, owing to the lack of time, to develop the reasoning and observing powers of the children. Instruction, reduced as it is, per force, to dry recitations or mechanical exercises, is barren in the lower grades, where this evil is the worst, while in the higher grades it cannot but be fettered, and must produce results below what might be expected from so choice a body of teachers, and so excellent an organization.

School Manuals.—Every one of the various courses of study that we examined has joined to it, by way of complement, pedagogic directions for the use of teachers. Prepared, as these are, by competent persons, they bring the attention of teachers to the carrying out of the courses of study, the mode of conducting recitations and the nature and aim of practical exercises; in a word, they give the school system a unity that secures the regular progress of instruction, while it renders inspection more effective.

Country Schools.—Owing to the representations of certain enthusiastic travelers, a most lovely idea of the American rural school-house is common in France: it is pictured as a nest among flowers. Thither resort, each morning, on prancing ponies, red-cheeked lassies and lads, grave and proud and respectful to their young mates as our cavaliers of the good old times. The mistress—herself young—smilingly receives them at the entrance, o'ershadowed by great trees. How remote is the reality from this picture, this charming exception to a state of things still in its rude beginnings! We traversed the vast plains where the husbandman struggles against an unconquerable vegetation, and the still half-wild valleys in the regions of iron, coal and oil,—and it was not our lot to find any such school idyl.

In the country, stone or brick school-houses form the exception; frame buildings, so cold in winter and so scorching in summer, are much more numerous, and the log-house has not yet disappeared. In the most flourishing States, what complaints are made against defective school accommodations! Let it not be said that, in describing the rural schools of the United States, we have sought out exceptional cases; we have tried our best to do justice to that great country, but we cannot conceal the fact that in the rural districts the school-houses are poor affairs and poorly equipped. Thus in Pennsylvania and New Hampshire, out of twenty-two teachers' reports, fourteen stated that the class-rooms were absolutely destitute of everything in the way of means for visual instruction, that is, there were neither maps nor blackboards; two schools had one map each; one school possessed an old globe; other schools no blackboards and no reading books; a single school was furnished with suitable apparatus.

The Courses of Study in Ungraded Schools are still in the tentative period, not to say in a state of chaos. Some are too succinct and barely outlined; others reflect the personal predilections of the teacher and show that ingenuous pedantry so often found associated with total inexperience. Sometimes a good deal less than the required course is done; sometimes it is greatly exceeded; such studies as history, music, composition, drawing and book-keeping being taken up, and in some cases algebra, physiology, geology, natural philosophy, and rhetoric even.

The worst evil from which rural schools suffer is irregularity of attendance. Teachers and superintendents bitterly complain of this. As a partial remedy, and as a means of allowing children to attend school without wholly depriving parents of their help, some States have lately established a number of "half-time" classes, in which attendance is reduced to a single session per day. This measure has everywhere been followed by good results, and it would perhaps be advantageous to introduce it into our French system, for the summer term at least, and in the case of the older pupils.

The Country School-houses are still in many instances built of wood, as are many of the finest dwellings, but they are frame buildings well put together, painted, and conveniently lighted. More frequently the constructions are of pressed brick with stone trimmings and slate roofs. You have only to see these coquettish school-houses, in the midst of vast lawns, shaded with fine trees and surrounded by palings, to judge of the place which the school holds in public opinion. It is indeed a national institution, devoted to the education of "boys whose votes will decide the fate of the Republic, and of girls, one of whom may be the mother of the president of the United States."

What specially distinguishes the country school-house of the United States from that of Europe is the absence of lodgings for master or mistress. Nowhere in the United States is this arrangement found. It is an evidence of a state of things not without its unfortunate side: the teacher is engaged for a year simply; he is paid by the month, and most frequently his certificate has but a limited duration. Under these circumstances he but comes and goes; when he is not a resident of the locality, he takes board for the school term and has nothing but a study or office in the school-house.

School-houses of New York City.—In the school buildings in New York City everything is sacrificed to the reception hall with its vast platform, fitted to hold a desk, several arm-chairs and a piano. In the hall it is that the stranger visiting the school is received. The movement of five or six hundred children entering in good order, to the sound of the piano, from six or eight adjoining rooms, while the folding doors opening below, show the smallest scholars ranked on steps—all this makes a fine show; but it is purchased too dearly, if the studies and the health of the children are to suffer thereby, as we cannot but think that they must.

The Kindergarten.—Infant Schools, which in France precede the primary school, form no part of the public school system of the United States. The few infant schools which exist are private establishments, or else free institutions, without legal recognition. Nevertheless, since 1871, Kindergartens on the Froebel plan have been attached to some of the public schools of Boston and St. Louis, and these establishments are every year gaining ground in a quite marked manner in all the States. The obstacles still encountered by the Kindergarten arise partly from American domestic manners, and partly from the prejudice which this German importation arouses in the minds of certain superintendents.

Woman in America is much less employed than she is in France, Belgium, and England, in industrial employments that take her from her household. "Home, Sweet Home" is for the Anglo-Saxon a species of worship, and in this sphere the wife is to maintain order, peace and happiness, by attending to her husband and children. It is not to be thought of that she should go to a place of employment in the morning and stay there till evening. The hearth must not be cold nor the house forsaken. And this is the motive that withdraws married women from public school-teaching. For what would become of her "home," and who would take care of her husband and children, when she was at school—generally considerably removed from her abode? In America the mother is the first instructor of her children, and generally she teaches them to read before sending them to public school.

In the Kindergarten exhibits at Philadelphia we noticed everywhere the application of Froebel's ideas, designed to interest children while amusing them, to excite and direct their attention, to accustom them to represent or put together objects of their own devising.

But with Americans the practical spirit is too strong for them readily to accept what does not offer an immediate result. One of the objections they urge against the Kindergarten is that it does not teach reading, writing and arithmetic (the three R's). Indeed, these institutions are not likely to meet full acceptance in the United States until it shall be shown that the general training they give to very young children will induce rapid school-progress, until it shall be shown that children bring from the Kindergarten a certain stock of practical notions. Besides, there is the question of expense, and how can $16 be gotten for the education of a child of from 3 to 7 years of age, when this costs only $10 or $12 for a pupil of from 7 to 10 years of age? If the Kindergarten has made its way at but a few points in the United States, it is the object of an active advocacy and has the sympathy of eminent educators. The application it has already received tends to free the Froebel system of any too exclusive form, and to adapt it to the wants and the genius of the country. This same result we should seek to attain in France, with the view of infusing life into our infant schools, and awakening the faculties of the child, instead of putting them to sleep by merely mechanical modes of procedure.

Reading.—The reading of the French language certainly presents sufficient difficulty; but the extreme complication and the numerous anomalies of English pronunciation render the teaching of reading in that tongue a still more delicate problem. Hence, in the United States, great ingenuity has been expended in the discovery of practical and speedy methods. Germany has furnished many plans which have been ingeniously modified and applied.

The ancient alphabetic method is now scarcely used at all in good schools. It is the longest and most monotonous method —and it is the method best known in France. This method was not represented at the Exposition. Even in the country schools in the United States, there are not on the average twenty in a hundred that use the old spelling plan, and in many States it is not employed at all. Manifestly public opinion has pronounced for the new methods.

In the phonic method, imported from Germany, the teacher drills the child first in the pronunciation of the sounds of the language, then in distinguishing the signs by which these are represented. He thus proceeds from the sound to the symbol, from the letter uttered to the letter figured, in place of passing from the name of the letter to its phonic value, which is often very difficult. However, this method, applied strictly and in its whole scope, assumes that, as is the case of German, a given letter always corresponds with a given sound, and this is not the case with the English language. Hence many objections have been raised to the purely phonic method, which indeed had to be modified into the word method or the phonetic method.

The phonic method, even when aided by all the American improvements of the word method, will always meet with grave objections. Excellent for German and Spanish, in which a letter has rarely more than a single power, it encounters in French, and still more so in English, anomalies resulting from the constant use of the same sign for different sounds, or of two different signs for the same sound, not to speak of useless double consonants, silent letters, etc. This consideration has led to the invention, by Dr. Edwin Leigh, of a method based on the same principle, but which in its application has recourse to typographical innovations. In many schools the teachers make use of the Leigh method in connection with the word method, and this is called the *eclectic* method, for in America every new device assumes a pretentious name.

In most of the schools visited by us, special importance is attached to class exercises in pronunciation. The lady teachers throw a certain ardor into the work of articulation, and, if need be, they show the play of the vocal organs in the production of a given sound or element, as for instance *th* hard, or guttural *r*, etc. It is to be desired that this were done in France, and that our teachers appreciated the utility of this vocal gymnastic, as bearing on reading or even on spelling. No pains are spared to give the pupils a correct pronunciation, not only in the primary but also in the most advanced classes. The master reads in a loud intelligible voice a passage from the Reader suited to the grade. The pupils repeat it in the same tone and with the same inflections. This is one of the liveliest and most curious exercises in an American school, and one which we have often witnessed with the keenest interest. The preceding account proves what importance is attached to reading in the United States. The method employed, very generally a rational one, secures the speedy acquisition of reading, and inspires pupils with the love of reading; this is, doubtless, one of the reasons why there is no other country where people read better or read more.

(The two following recommendations to French teachers, drawn from the Commissioners' observations of American methods of teaching reading, merit the special attention of school officers and teachers of Connecticut). 1. *To render primary instruction in reading not only more attractive, but more profitable, by enlivening it by means of object lessons, and carrying it forward in connection with writing and rudimentary drawing.* 2. *To give more attention to pronunciation, delivery, emphasis, and expressive reading.*

The Mother Tongue.—The courses of study and the directions for teaching the English language reveal everywhere a truly practical spirit, and are full of judicious considerations. It is with entire justice that distinction is made between language training and grammatical study. It is readily understood that the English language, in which the laws of concord amount to scarcely anything, may content itself with this practical study. French, which deals more in rules and orthographic details, requires more attention to grammar.

Two abuses strike us in the numerous papers on grammar and analysis that came under our eye. 1. The complication of parsing and analysis. In France also we carry written parsing too far, for everywhere routine acts in the same way and transforms into a mechanical exercise what, within proper limits, ought to be a valuable intellectual discipline. 2. Subtlety of distinction and complicated terminology. In grammatical instruction it seems to the Americans that the simplicity of English syntax ought to be made up for by a lavish use of scholastic distinctions, which, unfortunately, correspond to nothing in the construction of language. Dictation exercises which occupy so prominent a place in our French schools, are rare in the United States.

A feature that deserves unreserved praise, and which we found in the better schools in the United States, is the development of the inventive faculty of the pupil by means of composition-exercises outlined in the most general manner. Even in the primary schools the teachers are beginning to require the pupils to write out an account of what is represented in a picture in the text-book or in a chromo placed before them. This is a capital exercise, and one that we cannot too strongly recommend for adoption in our French schools. The task consists simply in practicing the scholar in observing attentively, in telling what he sees, and in telling this in an orderly manner.

Geography has long been a favorite study in American schools. It could not be otherwise in a country that has so many reasons for devoting itself to this science,—the immense extent of its territory, the great diversity in its phyiscal conditions, resources and population, the importance of its commercial relations with the whole world, not to mention the circumstances of its origin, whence it results that no land is absolutely foreign to it.

In response to a well understood want, geographical instruction early assumed a methodical form: this form, without being original, has still an American character, something national and *sui generis.* The old mode of instruction, bristling with repulsive nomenclatures which in nowise spoke to the mind or the imagination, and which merely loaded the memory, is still doubtless found in a multitude of rural schools; for in speaking of the United States in general, it must never be forgotten that there is a distance of nearly half a century between the country school, properly so-called, and the town or city school.

One of the happiest symptoms that strike the attention at the slightest examination is that geographical study now almost always begins where it ought to begin—*by making the child acquainted with the neighborhood, by a plan of the class room, the school-house, the street, the village;* in a word, a knowledge of the points of the compass, not merely on the map and as a matter of definition, but in nature, in a given locality. This very fact is an indication justifying the belief that geographical reform has penetrated deeply into educational practice, for it is generally by such beginnings that this reform ends. It is more difficult to bring about a rectification in the manner of teaching these rudiments than it is to perfect subsequent instruction. And that this progress has been made in the United States is manifest in every way,—by the text-books, the courses of study, and the numberless specimens of work done by the scholars. The strong point in all this new geographical training is that it is really a series of object lessons, that it begins with the child's own stock of knowledge instead of overwhelming him with abstractions and definitions.

Without overlooking the progress already made, we received the general impression that the new methods have not yet penetrated into the heart of primary teaching; they are known and applied sometimes in an admirable manner in the larger cities and in *élite* schools, but they are still unknown in most country schools, and between these two extremes are thousands of schools which as yet have hardly begun to feel the influence of the new ideas, and thousands that have the letter without the spirit thereof. The following features of American geographical teaching are recommended as worthy of imitation:—

I. *To begin with the synthetic method, which, starting with local geography, progressively enlarges the horizon of study, but not to dwell too long on local geography; to give pupils notions of general geography and cosmography as soon as they are able to receive them.*

II. *To practice pupils early in map drawing from memory and in reproducing on the blackboards the proximate forms of countries.*

III. *To insist on the descriptive part, without going out of the way to seek the picturesque, and paying particular attention to imparting correct ideas on the relief of countries, their general features, the nature of the soil, climate, production, etc., above all, great attention to what the English call "physiography."*

Arithmetic.—In American schools nothing is equal to the care with which the child is trained in the intelligent application of the four ground rules. No sooner does the pupil know the simplest numbers, 1, 2, 3, that is the *a b c* of calculation, than means are found for setting him to work in combining them by addition, subtraction, multiplication and division, in such a way as to bring into play all the faculties of attention, reflection and judgment. Beyond this first stage, the teaching of arithmetic generally quits the good way we have indicated, and ceases to be the supreme agency of intellectual culture. It seems as though the sole aim now were to impart hastily the practical means of resolving this or that kind of operation.

The principles that might light up the progress of the pupil and exercise his wits are almost voluntarily left aside. He commits to memory how, in a given case, he should state a proposition, what rule he should follow—whether or not he has learnt the *why*—and he applies the rule, with confidence and in a routine manner to exercises similar to that which served as an example. Practice before theory—such is the idea that generally prevails. And the method of proceeding is generally as follows: The teacher, or one of the most advanced pupils, sets forth on the blackboard each point in an operation to be learned, while the pupils follow, verifying in their book the course indicated; then the latter reproduce on their slates the same work, retain the rule by heart and apply it, point by point, to new examples. The rationale of the procedure is given only in case the curiosity or good sense of the scholar calls it out.

Great efforts are now making to bring back arithmetical teaching to a more rational way, to ally in just measure theory and practice, by a recurrence to the principles of analysis as well as of synthesis. By the solution of a good many problems of the same kind, dealing with quite small numbers the pupil is led to formulate for himself the method to be pursued in the exercises assigned to him. His memory is then not the only faculty brought into play; he reasons and draws conclusions; his good sense develops, he acquires correct language, acquires a taste for what he does, and gains strength for greater difficulties. Arithmetic has its principles and its axioms, just as geometry has, and it is by setting them forth, by developing them logically that the pupil's intellect is sharpened and his judgment exercised and himself fitted for the intelligent practice of calculation. [The following American methods recommended to French educators, need to be more generally applied by our teachers.

I. *To prepare children for the study of arithmetic by the use of the abacus, without prolonging this exercise too much.*

II. *To extend the use of mental calculation, as well in the form of operations carried on in the head as in that of the rapid solution of such problems.*

III. *Not to be afraid of practicing children from an early age in mental calculation, fractions, complex numbers, the metric system—the whole presented not in the rigorous and definitive order of ulterior instruction, but under the common, elementary, analogical, and, so to speak, provisional form suited to a first survey of the subject.*

Drawing in the Public Schools.—Six years ago drawing was taught only in certain special schools, and that in a very imperfect manner: there were no models, no methods, no materials, no masters. A committee was formed, and in a few years a whole system of instruction was devised. In some states, Drawing has been made obligatory; four methods, strictly graded and completing one another, bring the arts of designing within the reach of pupils of all ages; public expositions are increasing; all regular teachers are put in the way of teaching this branch of education; a normal school of art, to which flock pupils from all parts, has been founded and a fruitful emulation has arisen among various cities. If we take into account that these are the fruits of a few years of trial, it must be acknowledged that such remarkable results were never before obtained in so short a time. The following are the recommendations made on the subject of drawing:

I. *To commence drawing as soon as the child enters school, by slate or blackboard exercises, using the aid of squares or better style* *of points regularly placed in such a way as to leave to the pupil the drawing of the lines.*

II. *To advance gradually from the straight line to elementary geometrical figures, then to more complex combinations, and so to industrial and ornamental drawing.*

III. *Especially to practice the eye by elementary studies in perspective, by the recognition of distances by sight, and by the observation and comparison of forms.*

IV. *To proscribe drawing by mere fancy or chance, which falsifies the taste.*

V. *To organize for pupil-teachers methodical courses of drawing suited to their future wants.*

High Schools.—Everywhere High Schools are the special object of attention on the part of School Boards and towns having over 500 families—say from 2,000 to 2,500 inhabitants, do not shrink from taxing themselves for their suitable accommodation. In most cases, these schools are for both sexes. No part of the American school system is more essentially national than are the High Schools, no part of the system presents features that are more original, or, in some respects, further removed from European ideas, no part of the system is worthy of more profound study. Peruse the course of study in these High Schools; think of those children of workmen and work-women passing four or five years in adorning, strengthening and cultivating their minds by studies that everywhere else are reserved for the well-to-do classes, and tell us if these institutions do not bear the very seal and impress of American civilization. Need one be astonished, then, at the frank pride with which the American citizen speaks of these schools? Has he not a right to be proud when, by sure documentary evidence, he shows us the son and the daughter of the humblest artisan so mentally elevated that between them and the privileged of fortune no difference of culture, no trace of intellectual inferiority, is to be discovered? If it is glorious to see society freely giving to the poor the benefit of a public school education, is it not a still more extraordinary spectacle to behold a nation that deems it would wrong its humblest citizens were their children denied *any* opportunity for the full and free expansion of their minds? Here is a country where there are hundreds of free High Schools, on the same footing as the most primary establishments. They are of one body with the common schools, are administered by the same authorities, supported by the same funds, and intended for the same population; and yet, instead of being limited to the strictly essential studies, to the minimum of knowledge required to take children out of the official category of the illiterate, these upper schools are established on the basis of what may be called the higher instruction. They are not professional schools, nor are they bastard imitations of the classical college, nor yet low grade universities—they are in the fullest sense popular schools, intended to give the people the best, purest and loftiest results of liberal education. They open up no special pursuit—they lead to all pursuits, without exception and without distinction. They do not make an engineer, an architect, or a physician, any more than they make an artisan or a merchant, but they form bright, intelligent youths trained to studies of every kind, qualified to select for themselves among the various professions, and skilled to succeed therein. One graduate will enter the university, another will go into business; there will be differences of occupation among them, but there will be no inequality of education.

So far as social equality can possibly be reached on this earth, it is attained by the American High School. In other countries it is to be feared that the children of different classes of society, though brought together for a while in the public school, must soon find themselves separated by the whole distance between their respective families; indeed, it must be so, since one child enters on his apprenticeship and thus stops short in his intellectual development at the very time when the other is just beginning his. In the United States every effort is made to delay and to diminish this separation, to carry as far as possible, and as high as possible, that common instruction which effaces the distinction of rich and poor.

If it be true that the prosperity of a republic is in the direct ratio of the replenishment of its middle classes, of the abundance and facility in the indefinite recruiting of these classes, then the High School of the United States, whatever it may cost, is the best investment of capital that can possibly be made.

[Of the conclusions reached by the Commissioners, the following are the most practical and suggestive to Americans.]

Summary of Conclusions.—1. The common schools of the United States are essentially a national institution; they are dear to the people, respected by all, created, sustained and enriched by a unanimous spirit of patriotism which for a century has shown no falling off; in a word, they are deemed the very source of public prosperity, as, *par excellence*, the conservative and protective institution in their democratic government and republican manners.

2. The school organization is rigorously municipal. The law simply establishes as a principle the necessity of public instruction, leaving to each community to provide for its own needs in its own way.

3. The higher direction and the inspection of the public schools are confided to elective boards. From this peculiarity arise various results, as, for instance, the frequent renewing of the Boards and Superintendents, the unfortunate influence of political prejudices and local interests, the liability to sudden changes in the school organization, and, finally, *the necessity imposed on the people to keep themselves informed on school questions, as matters on which they have constantly to vote.*

4. The public schools are in all grades absolutely FREE: the abolition of fees was in every State the signal of the new birth of the public schools; it brought into these establishments the children of all classes of the population, and constantly tends to bring them nearer and nearer together.

5. The public schools are absolutely unsectarian.

6. Compulsory education, made matter of law in some States, has doubtless aided the development of common school instruction. The results thus far ascertained are not very striking; and besides it is impossible either to pass or to carry out the measure in the very region where its urgency is most pressing, that is, in the South. In general, the most practical form that compulsion has assumed is the hunting up of vagabond children or the adoption of various measures to force them into school, to begin with, and then, if need be, to transfer them to reform schools or other special establishments.

7. Public school instruction in the United States does not

form a course of study apart, strictly limited to a minimum or completely distinct from classical instruction; it comprises three degrees—the primary, the grammar school, and the high school course—sometimes combined in a single school, and again subdivided among three different schools, but in all cases *connecting with the higher education*, whether literary or professional, so that a child of the working class has the opportunity of gratuitously continuing his education as far as his tastes and aptitudes permit.

8. The training of teachers is now almost universally regarded as the essential condition of sound, popular education, and the number of State Normal Schools is rapidly increasing.

9. As the career of teaching is often taken up merely provisionally by young men or women who do not intend to continue in the field, there results a very grievous instability in the teaching force—though it should be observed that there is some compensation for this evil in the fact that it draws into the work a large number of young schoolmasters full of ardor, equipped beyond the needs of the common school course, and untrammelled by the spirit of routine.

10. The coëducation of the sexes is the rule in the American public school system, and except in some of the great cities is becoming more and more the rule. The results of this usage are generally represented as excellent in both the moral and the intellectual aspect. The only or at least the chief objections heard, are based on the excess of labor which the system imposes on young girls.

11. From these causes and from the marked taste of Americans for innovation and new departures, it has come to pass that the schools of the United States show a diversity of organization, and a multiplicity of forms, courses of study, text-books, and methods, which result in much experimentation and a lamentable loss of time; but which, by leaving a great deal to the free choice and responsibility of teachers and local authorities, interests them directly and personally in the success of the school.

12. Thence result, also, extraordinary efforts and boundless liberality directed to giving the schools, both in the construction of the buildings and in the establishment and maintenance

of the institutions, an air of comfort, of amplitude, and almost luxury, which is not merely a satisfaction to municipal pride, but is mainly the means of giving the public schools the prestige necessary to bring within their fold all classes of the population without distinction.

13. The great publicity given to the Reports of Committees and Superintendents, the interest taken by the people in school statistics, and the beautiful and simple organization of the National Bureau of Education do more for the growth and improvement of educational institutions than could possibly be accomplished by the *orders of any administrative authority*, even though clothed with the most extensive power.

14. If, with all these educational facilities, the United States still show a considerable proportion of illiterate population, the explanation is found, first, in the fact that the whole South is yet a region to be conquered for public school instruction, and secondly, because immigration is incessantly bringing in a fresh contingent of illiterate adults.

15. The educational methods of the United States are in general distinguished from our own by two characteristics, which may by turns be either advantages or defects. On the one hand they tend to become essentially objective, synthetic, analogical, active. On the other hand, they are eminently practical, being planned and practiced with reference to the wants of life and to direct utility.

16. And so in the choice of subjects to be taught, the American system is marked by the selection of the most indispensable matters, of the most rapid methods, of the most positive successes, of those advantages which if not the most important for mental improvement, have the most direct bearing on the present or future interest of the pupil,—an aim which is very well in principle, but which, when too exclusively sought, stamps study with an empirical and utilitarian impress, gives a narrowness to education, and to a certain extent cramps the mind itself.

17. As regards methods of teaching, the American system recommends itself by a frequent appeal to the pupil's own powers, to his intellectual and moral spontaneity. It cares less for the logical order of ideas than it does for the natural order of

impressions; it leaves a large independence to the teacher and a still larger to the scholar,—whence an extreme diversity in the modes of procedure and a not less striking inequality in the results. Many and many a time one is struck with the hasty, rapid, almost improvised character of a plan of education which trusts implicitly to good instincts, good sense, and good will, which aims ever to address the eye, the memory, the imagination, which would thus gain time over the old strictly didactic methods, but which by so doing, runs the risk of becoming somewhat superficial, and is in danger sometimes of dispensing too much with the severe but fruitful labors of abstraction and reasoning.

We are not of those who, ignorant of the marvellous proofs of moral and material vitality which the United States have shown, think that we have discovered in this grand body the germ of decomposition and prophesy its near ruin. This is perhaps *the* people, of all the earth, which has in its immense domains the grandest deposits of natural riches; in its temperament and character the most powerful motive to action; in its historical traditions the noblest example of energy, efficiency, courage and civic honor, and in its institutions the system best fitted to favor the rise of liberty, and these are some of the forces which ought to resist the toughest trials. But while we do not overlook these most promising signs, we do not conceal the formidable problems which the country has still to solve. The antagonism of races, traditions and interests which brought on the bloody conflict between the North and the South, the irruption of the blacks into public life, a just but terrible punishment of a civic wrong, the difficulty of long maintaining the bonds which unite peoples so diverse, spread over a territory so immense; all these are grave questions. These however are thrown in the shade by a danger more immediate, and that is the alteration, say rather the corruption of political morals, the question of elections, and especially the election of President, whether this shall be made by the intelligence and virtue of the people, or whether it will veer about and become the prey of intrigue and corruption.

CLINTON RURAL IMPROVEMENT ASSOCIATION.

As calls are often made for a plan for Village Improvement Societies, I insert that adopted in Clinton.

1. This Association shall be called "The Rural Improvement Association of Clinton."

2. The object of this Association shall be to cultivate public spirit, quicken the social and intellectual life of the people, promote good fellowship, and secure public health by better hygienic conditions in our homes and surroundings, improve our streets, roads, public grounds, side-walks, and in general to build up and beautify the whole town, and thus enhance the value of its real estate and render Clinton a still more inviting place of residence.

3. The officers of this Association shall consist of a President, a Vice-President, a Treasurer, a Secretary, and an Executive Committee of fifteen, six of whom shall be ladies.

4. It shall be the duty of the Executive Committee to make all contracts, employ all laborers, expend all moneys, and superintend all improvements made by the Association. They shall hold meetings monthly from April to October in each year, and as much oftener as they may deem expedient.

5. Every person, who shall plant three trees by the road side, under the direction of the Executive Committee, or pay three dollars in one year or one dollar annually, and obligate himself or herself to pay the same annually for three years. shall be a member of this Association.

6. The payment of ten dollars annually for three years, or of twenty-five dollars in one sum, shall constitute one a life member of this Association.

7. Five members of the Executive Committee present at any meeting shall constitute a quorum.

8. No debt shall be contracted by the Executive Committee beyond the amount of available means within their control, and no member of the Association shall be liable for any debt of the Association, beyond the amount of his or her subscription.

9. The Executive Committee shall call an annual meeting, giving due notice of the same, for the election of officers of this Association, and at said meeting, shall make a detailed report of all moneys received and expended during the year, the number of trees planted under their direction, and the number planted by individuals, length of side-walks made or repaired, and the doings of the Committee in general.

10. This constitution may be amended at any annual meeting by a two-thirds vote of the members present and voting.

THE FIELD PARKS.

BY

B. G. NORTHROP.

[From Report of the Connecticut State Board of Education.]

NEW HAVEN:
TUTTLE, MOREHOUSE & TAYLOR, PRINTERS.
1879.

The example set in Haddam deserves to be copied in other towns. In the language of Ex-Governor Hubbard, this "work of Village Improvement will not fail, I trust, to awaken public attention and provoke imitation throughout our State, and excite and even shame our own people into a larger public spirit and better efforts to redeem from negligence our rural homes and villages."

THE FIELD PARKS.*

On the thirty-first day of last October, the four surviving sons of Rev. David Dudley Field, D.D., celebrated the seventy-fifth anniversary of their father's marriage, by presenting to the town of Haddam two tracts of land for public parks, one known as Meeting House Green, the other including Isinglass Rock, west of the Brainard Academy, and comprising ten acres. The grounds of the Brainard Academy are thus virtually enlarged and made exceedingly attractive. The whole park, finely laid out with drives and walks by F. L. Olmsted of New York, the landscape gardener, and adorned with the choicest ornamental trees indigenous and imported, is a grand contribution to the taste, sociality, good fellowship,† education, growth and prosperity of the town. The high bluff, "Isinglass Hill," commands for many miles a magnificent view of the river and its valley, with the long range of hills beyond. This valuable addition to the grounds of the Brainard Academy suggests and invites a corresponding enlargement of its funds. Brainard Academy, useful as it was in Dr. Field's day, is now crippled for want of an endowment.

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* The following is the circular issued for the Park Presentation.

FIELD MEMORIAL.

HADDAM, CONN., October 24th, 1878.

DEAR SIR:

Messrs. David Dudley Field, Stephen J. Field, Cyrus W. Field, and Henry M. Field, surviving sons of REV. DAVID D. FIELD, D.D., having purchased and laid out two plots of ground in the centre village of Haddam, will *on the 31st inst., at two o'clock*, make a formal presentation of the same in trust to the town as a public park, and as a MEMORIAL of their parents who spent a considerable portion of their lives here. The undersigned, representing the town in this regard, beg most cordially to invite you to be present at the centre village of Haddam, when such presentation is made, and there to meet the Messrs. Field. It is believed that this is the first instance in which a gift with such an object has been made, and it is thought that some public notice should be taken of it; the gift to the town is generous, and it is reasonable to hope that others may be led to imitate an example so worthy, and so timely in view of the growing interest in rural adornment throughout our State.

Respectfully Yours, MINER C. HAZEN, A. H. HAYDEN, GEO. W. ARNOLD, CYRUS A. HUBBARD, O. F. PARKER, *Committee of Arrangements.*

† It is already decided to hold in this park an annual festival to cultivate public spirit and stimulate an interest in further village improvements.

Dr. Field was long the most prominent and pronounced friend of popular education in this town and county. He took great interest in the common schools and especially in the Brainard Academy. Says A. B. Cook of Chicago, "I well recollect how we boys in Haddam liked to have Dr. Field visit our school, with his genial, kind face and benevolent smile of recognition *for us all*, and how he cheered us in the Academy when we began the higher branches." Hon. D. N. Camp speaks in strong terms of the pleasure and profit with which, more than thirty-five years ago, he "listened to his timely lectures on public schools, ably setting forth broad and earnest convictions of the importance of educational progress." The history of the Brainard Academy and its early association with Dr. Field, its beautiful and healthful location, its surroundings in an orderly, intelligent and moral community, and this grand park in the rear, practically a part of its own grounds, render this a most eligible site for a first class institution of learning. A large group of towns surrounding Haddam are unfavorably situated for the maintenance of separate High Schools, from which a well endowed Academy in this central position, easily accessible, both by railroad and river, would draw a liberal patronage. There is a hope, not to say expectation, that some generous benefactions will place this institution on such a basis of wide and permanent usefulness as shall realize the desires and anticipations of Dr. Field. What worthier monument could be erected to his memory than the liberal endowment of this school, for the upbuilding and improvement of which he labored with such well directed zeal.

The Field Memorial Park is here noticed for the double purpose of calling attention to the pressing needs of Brainard Academy and giving a cordial acknowledgment of the donation of the Field brothers. In behalf of the friends of education so far as I may represent them, I desire to express a high appreciation of their grand gift to Haddam and thus to Connecticut, for our *State* takes a lively interest in the growth and prosperity of each of her towns. This worthy example ought to make many others, opportune as it is, in view of the growing interest in rural adornment throughout our State. There is hardly one of our towns that has not at home or abroad some favored sons who, by forming parks or founding schools or libraries, could easily render this most fitting tribute to their mother soil.

The sentiment that honors and cherishes one's birth-place is noble and ennobling. I am aware that a popular prejudice associates weakness and effeminacy with such taste, refinement and liberality. But this sentiment has ever characterized the greatest and best of men and is a prime element of true manhood. The cold and selfish soul is sterile in heroic virtues. There is a New England railway king, now a millionaire, who seldom visits his native town, takes no interest in it, does nothing for it, and leaves even the old homestead and grounds, though still owned by him, neglected and forlorn. Indeed such examples are too common. On the other hand, the greatest grandeur of intellect accords with fervor of filial feeling, with fondest home attachments and with refinement and delicacy of taste. It is perfectly in keeping with the intellectual greatness of Daniel Webster to find him fondly cherishing and beautifying the old homestead, enriching and improving the paternal acres and eloquently discoursing on the sacred associations of home, the transcendent sweets of domestic life, the happiness of kindred and parents and children. Washington was as delicate, courteous and affectionate in his domestic relations and attachments as he was wise in council and courageous in war. A beautiful trait in Bryant's character was evinced by his devotion to the old homestead and the little secluded town of Cummington among the Hampshire hills, hallowed to him by the memories of father and mother, and the sacred association of childhood. To that little town which he did so much to adorn and enrich and educate, he ever deemed it a privilege to make an annual visit—a summer visit with his household, often prolonged for weeks and months. That the old early associations might remain, raising the old house, he built beneath and around it a stately mansion, so that the paternal rooms remained intact.

It is a good omen that public interest in the embellishments of rural homes and villages is widely extending, and that the varied charms of the country with its superior advantages for the physical and moral training of children are attracting many thoughtful men to the simpler enjoyments and employments of rural life.

Dr. Bushnell, with his keen observation and intense love of rural scenery was wont to say, "No part of our country between the two oceans is susceptible of greater external beauty than Connecticut. It is not in the great cities nor in the confined shops of trade, but principally in agriculture that the best stock or staple of men is grown. It is in the open air, in communion with the sky, the earth, and all living things, that the largest inspiration is drunk in and the vital energies of a real man are constructed." A taste for rural adornment is a source of physical, mental and moral health as well as enjoyment. The parentage of parks, lawns, trees, flowers, vines and shrubs becomes a matter of just pride and binds one to the spot he has adorned.

Nature is the great educator. Birds, flowers, insects, and all animals are our practical primary teachers. In God's plan, facts and objects as best seen in the country are the earliest and the leading instruments of developing the faculties of the juvenile mind. They cannot be fully trained when cooped up within brick walls, witnessing only city scenes.

The excessive passion for city attractions and ambition for easier lives and more genteel employments have brought ruin to multitudes and financial disaster to the nation. A great peril to the land to-day comes from the swelling throngs, ranging from the reckless tramp to the fashionable idler, who are ever devising expedients alike foul or fair, to get a living without work. The disparagement of country life has been one of the worst tendencies of the times. The country has ever been the great school of mind, and has sent forth far more than its proportion of gifted men to the centers of influence.

Every influence should therefore be combined to foster these home attachments, for there is protection as well as education in the fervent love of home with its sacred associations. Patriotism itself hinges on the domestic sentiments. When one's home becomes the Eden of taste and interest and joy, those healthful local ties are formed which bind him first and most to the spot he has embellished, and then to his town, his State and country. Whatever adorns one's home and ennobles his domestic life, strengthens his love of *country* and nurtures all the better elements of his nature. On the other hand, any man without local attachments can have no genuine patriotism. As happy in one place as in another, he is like a tree planted in a tub, portable indeed, but at the expense of growth and strength. Said Monsieur Lariaux, the French Deputy to the American Evangelical Alliance, in his farewell address, "your homes, homes, *sweet* homes—these are the safeguards of your freedom. Oh pray, as you gather at your family altars, that my poor France may have such homes."

Dr. Field really was the father of the Brainard Academy. He started the project, selected the site, planned the building and prompted the Brainard brothers to build and endow the school. He was chairman of the Board of Trustees and the chief manager of the school. He laid the corner stone and gave an able address on that occasion, June 3, 1839, which was published entire in the Middletown Constitution, a copy of which is furnished me by the kindness of a citizen of Haddam who heard it. A few extracts from this address are here pertinent. "The corner stone of Brainard Academy on this beautiful site is now laid. The institution owes its existence to the liberality of the two brothers N. and G. Brainard. May they live to see the good effects of their bounty in the growing intelligence, virtue, and good order of this community. The Academy is designed particularly for intellectual education, but knowledge should be inculcated in connection with those principles and motives which are most likely with the Divine blessing to lead youth to virtue and piety. Our capacity for knowledge suggests the importance of education. Endowed with understanding, we are criminal if we do not cultivate our intellects. What is so plainly a duty is also essential to our happiness. Ignorance instead of being "the mother of devotion" is the mother of errors, crimes, and abominations innumerable. Penitentiaries and prisons confirm this declaration. Ignorance is the mother of nothing good. The animal gratifications which may be enjoyed without education are the lowest allotted to man, and even these education regulates and refines. Knowledge everywhere is power, but associated with virtue, it is power for doing good, power to get property, without which the great ends of civilized society cannot be attained. The arts involved in husbandry, manufactures and commerce are based upon science. Were education more extended and elevated, more inventors like Fulton and Whitney would arise to bless mankind. For the want of education, how few things have savages to make life comfortable. The attachments of husbands and wives, of parents and children, and of members of their tribes, are more like the attachments of bears and tigers to their mates, their young and company. There is nothing of the taste and refinement needful to make home wholly *sweet home.* But some, admitting the importance of a common school education, affirm that the higher branches are not needed. This is a mistake. Both are essential to important purposes in society. Both need to be more cultivated and elevated than they have ever yet been anywhere in the world. Besides, the common branches of education will not be cherished without the higher. The common schools of our country were introduced by the best educated men of the times. None know the value of education so well as those who have enjoyed its benefits the most. These are the most efficient and able advocates of education in all its branches. All the light possessed and reflected by the inferior orbs comes down from the sun. In view of these principles, with what emotion should we regard the commencement of an institution like this—an institution long needed here, long hoped for, and now about to be realized. Such an institution duly managed promises unspeakable good. And who are interested in this? Primarily the youth whom I see around me and who will soon experience its blessings. Many will attend this Academy who could not command the means of going out of town for their education. All may here gain a superior education and enjoy at the same time the guardianship of parents and the kind offices of friends. Parents are interested for they live in their children. The patriot, the philanthropist, the Christian is interested. Who then is there that loves the young, that loves society, that loves the church, that loves the soul, who will not pray that *our sons may be as plants grown up in their youth, that our daughters may be as corner stones polished* *after the similitude of a palace.* Pray we must for *except the Lord build this house they will labor in vain who build it.* Except He prosper us, our fond anticipations for this institution will not be realized." The dedicatory prayer which Dr. Field then offered is remembered to this day by the older citizens of Haddam as an earnest and almost an inspired production.

It is fitting to follow this address of Dr. Field by that of his eldest son given at the dedication of the Field Park.

"LADIES AND GENTLEMEN:—You know that we are here to deliver into your hands the parcel of ground on which we are standing, and that other which lies in view before us, to be kept as pleasure grounds for the people of Haddam in all time to come. We give them in memory of our father and mother, who were married seventy-five years ago to-day, and came immediately afterward to make their abode on this river-side, where he was soon to become the pastor of the church and congregation. Here they lived active and useful lives, in the fear of God and love of man, doing faithfully their several duties, he in public ministrations from pulpit and altar, at bridal, baptism, and burial, and she in the quiet tasks of her well-ordered household. Though now, after more than fifty years of wedded life, they sleep side by side in the pleasant valley beyond the Connecticut hills, where their last days passed serenely away, they were faithful until death to the love of their early home. Natural indeed it was, for here they passed their first years together; here they raised their first domestic altar, and here most of their children were born. For this cause, and in grateful remembrance of their love and sacrifices for us, we, their surviving children, four of us only out of ten, present these memorials, not of cold stone, though the hills about us teem with everlasting granite, but of shaded walks, green lawns, and spreading trees, where this people may find pleasure and refreshment, generation after generation, so long as these fertile meadows, these rugged hills, and this winding river shall endure. And remembering that "beauty is truth, truth beauty," we hope that they will cultivate here that love of nature, which is a joy in youth and a solace in age; which nourishes the affections, and refines while it exalts; which rejoices in the seasons and the months as they pass, with their varying beauties; catches the gladness of June and the radiance of the October woods; and in every waking moment, sees, hears, or feels, something of the world around to take pleasure in and be grateful for. We trust that they will come, not in this year only or this century, but in future years and centuries, the fair young girl, the matron in the glory of womanhood, the boy and the man, grandson and grandsire, in whatever condition or circumstance, poverty or riches, joy or sorrow, to find here a new joy or a respite from sorrow; to drink in the light of sun and moon, listen to the music of birds aud winds, feel the fresh breath of life-sustaining air, thank God and take courage.

Reverently then we dedicate these memorials of our parents, to the enjoyment forever hereafter of those, and the descendants of those, whom they loved, and among whom they dwelt."

The following letter of Governor Hubbard will be read with interest.

EXECUTIVE DEPARTMENT, STATE OF CONN.,
HARTFORD, October 29, 1878.

I have the honor to acknowledge the receipt of your invitation to be present at a memorial presentation by the Messrs. Field, of a public park to the town of Haddam. Engagements which I cannot control will oblige me to be absent. I regret this necessity; for, in the first place, I should be glad of an opportunity to present my respects to the very distinguished gentlemen to whom you are so much indebted for this endowment, and whose generosity and filial piety will cause the names of both father and sons to be remembered by your townsmen from generation to generation.

In the next place, I should be glad to mark my interest in a work of Village Improvement, which will not fail, I trust, to awaken public attention and provoke imitation throughout our whole State; and I shall not regret it, but hail it rather, if this addition to the attractions of your picturesque and historical old town, furnished by gentlemen from without the State, one of them from the other side of the continent even, shall excite and even shame our own people into a larger public spirit and better efforts to redeem from negligence our rural homes and villages.

Nearly all our towns are full of objects of natural beauty easy of development, and very many of them rich in legendary and historical associations. What is greatly wanted is something more of rural art and adornment. Something which shall beautify our country villages, educate public taste, make the homes of the fathers dearer to their sons and the local associations of childhood dearer to old age, and thus turn back, in part at least, the tide of migration from the rural towns, and make the city seek the country life and make it what it used to be in our own State, and what it still is in the oldest and most cultivated nations of the world."

I beg to remain with the highest respect,
Your obedient servant,
R. D. HUBBARD.

Letters were also received from President Porter, Ex-President Woolsey and General Walker, of Yale College, and from many other prominent gentlemen, and other able speeches were made before a large throng of people gathered from far and near. We regret that our limits do not permit the printing of these interesting letters and addresses in full. The citizens of Haddam provided a bountiful collation on the grounds. The large attendance, the admirable programme of the Committee of Arrangements, the fine music of the band, the excellent addresses given, the generous tables, ample for all, spread on these beautiful grounds, combined to make this an occasion of rare interest.

HIGH SCHOOLS.

BY

B. G. NORTHROP,
Secretary of Connecticut Board of Education.

HIGH SCHOOLS.

The late financial depression furnished an occasion for a general attack upon High Schools "along the whole line." Stern necessity demanded the closest scrutiny of all public expenses, the lopping off of all superfluities, and the practice of rigid economy. Hence the question of Free Schools and High Schools has been discussed of late by the Press more frequently and earnestly than ever before. Public Schools concern everybody, for as scholar, teacher, school-officer, parent, friend, or tax-payer, every one has some connection with them and feels prepared to pass judgment upon them. It is fortunate that they must bear the keen sunlight of publicity. In our country, where public sentiment is the ruling power that creates law and repeals it, no institutions can stand which cannot bear the closest scrutiny, while those which do stand the test of time and command the confidence of the people are sure to endure. Within narrow limits, passion or faction or party may rule the hour. But with intelligent people the sober second thought brings reaction, and the right prevails. The sharpest criticism, unjust though it may be, is more wholesome than indiscriminate praise. The blows which our schools get, like the hammer of the car-wheel inspector, serve by the ring of the metal to prove their strength and not to destroy them. These discussions, though often hostile, have awakened new interest and led to a better understanding of the aims and results of High Schools. The recent opposition to them seems to be prompted by no political or sectarian aim. Thus, while Governor Hubbard ably defended High Schools, Governor Robinson, of New York, and Governor Garcelon, of Maine, strenuously opposed them. The earnest blows of ex-Governor Robinson for a time threatened disaster to the system in New York, and the High School in one of her cities was abolished, but only to be reëstablished the following year on a more liberal basis; while the opposition in Maine succeeded in securing a suspension of the High School law for one year, but under such circumstances as to neutralize the influence of their action as an example.

The leading objections urged against Secondary Education are the following:

1. The High School is an excrescence on our school system, which has thus been extended beyond the original design of its founders, hence it should be cut off.

2. It is unjust to support the High School by a general tax, because it is patronized by few, and the majority receive no benefit from it.

3. The State has the right to educate its children only so far as will enable them to understand and perform their duties as citizens.

4. The High School tends to create a distaste for labor, and to make the children of the masses discontented with their lot.

5. The support of the High School is communistic in its principle and tendency.

6. The High School tends to disparage the common school studies and promotes superficiality in these fundamental branches.

7. It tends to pauperize the people by a sort of alms-taking that impairs their manliness and self-respect.

8. High Schools prepare few graduates for College.

Having aided in organizing many High Schools in Massachusetts and Connecticut, I have carefully watched their progress and results. On this subject the lessons of experience outweigh the speculations of theorists. Free high schools have been maintained in Massachusetts for a longer time and on a broader scale than in any other State or country of the world. The devotion of that State to high schools is not a sudden or transient outburst of enthusiasm due to any educational reformer. It is the growth of more than two centuries. The basis of the present High School law was laid in 1647, when the General Court made education universal and free, and required that every town containing *one hundred* families, should set up a *Grammar School*, which was substantially, the modern High School, the master whereof "should be able to instruct youth so far as they may be fitted for the University." In 1789 this law was made binding only upon towns having two hundred families. In 1826 all towns containing five hundred families were required to maintain a High School of the second grade, and every town containing 4,000 inhabitants was required to maintain a school of the first grade, in which the Latin and Greek languages should be taught.

To further meet the assertion that "the High School has been ingrafted upon the system, contrary to the original design," I condense the following from an address of Hon. P. Emory Aldrich, of Worcester, Massachusetts:

"It has been the settled and prevalent policy of these States, as well as of the General Government, to grant State and Governmental support to schools of every grade, from the primary up to and including the university, and this was the accepted theory and practice of the Colonies before the States were organized as they now exist. Sagacious and far-reaching views as to the necessity and extent of popular education were deliberately expressed by the men by whose wisdom and foresight States were formed and a nation created. The founders of our Republic clearly perceived that knowledge, and *not merely the rudiments of it*, generally disseminated among the people, is essential to that form of government which depends for its existence on the will of the governed. Nor were these views first expressed by the founders of our Republic. They were among the rich inheritances of civil wisdom derived from the Colonial period of our history, as shown by the celebrated ordinance of 1647, passed by the General Court of Massachusetts Colony. These are not the views of an accidental majority, of a sect or party, but the long-cherished principles of a whole people, who placed the duty of promoting education on the same footing as that of promoting trade, commerce and manufactures. It is too late to deny that superior education is *necessary* to the State, and it is precisely on this ground of State necessity that the public support of schools should be made, and not on the ground that they are mere benefactions. This policy should not now be abandoned, but, on the contrary, should be continued and extended to meet the growing necessities of the greatly enlarged and ever-expanding field of human knowledge and acquisition."

Judge Aldrich substantiates these views by the following quotations from the fathers of the Republic:

Laws for the *liberal* education of youth, especially of the lower class, are so extremely wise and useful, that to a humane and generous mind no expense for this purpose would be thought extravagant.—*John Adams.*

Knowledge will forever govern ignorance, and a people who mean to be their own governors must arm themselves with the power which knowledge gives. *Every class* is interested in establishments which give to the human mind its highest improvement. *Learned institutions ought to be favorite objects with every free people.* They throw that light over the public mind which is the best security against crafty and dangerous encroachments on the public liberty.—*James Madison.*

John Adams, the second President of the United States, after graduating at Harvard College, taught for two years the Grammar School of Worcester, and his cousin, Samuel Adams, in his message to the Legislature deprecating the increase of Academies supported by tuition, advocated the ancient and beneficial Grammar schools, in which he says "the poor and the rich may derive equal benefit, while none except the wealthy can avail themselves of the Academies." As Governor Adams feared, the High School law in many towns remained a dead letter. In 1838 only fourteen high schools were maintained in that State. When I entered the service of Massachusetts in 1857, the number had risen to eighty. At the present time Massachusetts sustains 216 High Schools with nearly 600 (595) teachers, and nearly 20,000 pupils. Ninety per cent. of her population is in cities and towns supporting High Schools.

In reviewing ten years of hard work, while officially visiting every town of that State, my thoughts recur to the High Schools then organized with lively interest. The struggle which they had to wage for existence is over. They have stood the test of time. No town within my knowledge, after fairly trying its working, has abolished its High School. *Nulla vestigia retrorsum* is their motto. Experience has vindicated the wisdom of their founders. Their results in many towns have disarmed opposition and converted doubters and foes to believers and friends. Their graduates especially are everywhere their advocates. In Massachusetts, as well as elsewhere, a few able and earnest opponents have recently appeared. But they have made little impression upon the popular mind. Opposition and discussion will ultimately help our High Schools, as they do any measure which can bear discussion and stand the ordeal of experience.

As the whole school system naturally culminates in the High

School, it furnishes the best and cheapest leverage for uplifting all the lower grades. As a center of interest and influence, it stimulates in *them* a healthful ambition for thoroughness as the condition of *admission and promotion*—a better tonic than the false hope held out by the stupid flatterer, who says in all schools and to all scholars, "if you try and aim high, you may each become President or Senator of the United States." It is ridiculous and harmful thus to encourage ambitions impossible of attainment, or awaken aspirations to positions for which nature has given no qualifications. To turn those fitted to be good mechanics, or farmers, into poor doctors, lawyers or ministers, is a wrong both to themselves and the community. The High School, by its sterner tests and harder competitions and rigid examinations tends to dissipate such dreams. It works like a sieve through which the little and heavy minds drop, or rather on the plan of the survival of the fittest, it helps the ablest to go on and up.

It is the testimony of the most competent observers that the High School gives increased efficiency to the elementary schools by its standard of admission, thus presenting in them a strong stimulus to studiousness and fidelity. Francis Adams, long the secretary of the National Educational League of England, says: "Experience has proved that *elementary* education flourishes most where the provision for higher education is most ample. If the elementary schools of Germany* are the best in the world, it is owing in a great measure to the fact that the higher schools are accessible to all classes. In England not only have the aims of the elementary schools been low and narrow, but an impassable gulf has separated the people's schools from the higher schools of the country. In the United States, the common schools have always produced the best results where the means of higher education have been most plentiful." It has been often remarked that "educational improvement works from the top downward and not from the bottom upward, and that the common school is always feeble where High Schools, Academies and Colleges are wanting." It is unquestionably due to the influence of Yale College that n her *early* history the public schools of Connecticut were, by common consent, the best in this country, and so pronounced in all the geographies of those days.

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* The elementary schools of Holland and Switzerland seem to me not to be surpassed by those of Germany. Mr. Adams' remarks fully apply to those countries.

The High School benefits the common schools by improving the *grading* of all the district or lower schools of a town, and thus increases both the *economy* and *efficiency* of the system. In many towns containing from eight to eighteen districts, where all were formerly taught by male teachers in the winter and females in the summer, on the establishment of a High School, *permanent* female teachers have been placed in all the others, obviating the evils of a semi-annual change of teachers, while the most advanced pupils from the whole town have been brought together in a central High School especially adapted to their wants, and all this with little or no increase of cost and sometimes with an actual saving of money. Such, for example, has been the case in Bridgeport, Connecticut, where during the first year after the establishment of an efficient High School with the union of the districts and better system of gradation, there was a *saving* of more than ten thousand dollars in the educational expenses of the city. The conviction became well nigh universal among the people of that city that the new system promoted the efficiency of all the schools as much as it did the economy of their management. In the Report of the State Board of Education for 1877, it is said, "no town in Connecticut has witnessed so great and general improvement of its schools during the last year as Bridgeport." In the city of New Haven, Connecticut, what was formerly the upper grade in the Grammar schools, is now transferred to the High School, where, to say nothing of the classics and higher mathematics, such studies as book-keeping and the practical sciences and even the *finishing* lessons in drawing and writing, are taught better and CHEAPER than they could be in the separate Grammar schools, and the efficiency and usefulness of all the other schools is thus increased. Nearly all the teachers of that city are now graduates of this High School. Its cost, therefore, is fully justified on the ground of economy and the improvement of the other grades, and the same is true generally. The School Board of another Connecticut town, after two year's trial, say: "The advantages of the High School to all the *other* schools is surprising. Never before has such a spirit of study prevailed among them. All, even the remotest districts, are represented in the High School where the more advanced pupils are brought into one school, graded according to their acquirements, so that on the principle of the division of labor, the effectiveness of one teacher is multiplied many times. Here our promising and ambitious scholars, even from the remotest sections of the town, are enjoying advantages never offered in the several district schools, made up of all ages and over-burdened with classes and studies."

High Schools are essential for the training of teachers. The Normal Schools can supply but a fraction of the great army of teachers in our land. The High School course constitutes the best preparation for that of a Normal School. The normal graduates who have achieved the highest success are those who had previously completed the High School course. All experience verifies the motto of Guizot, that "every teacher should know far more than he will be called upon to teach, for the more he knows of everything, the better he can teach anything." As a matter of fact, those who have had the fullest previous instruction most highly appreciate the advantages of the Normal School, while the greatest hindrance to its most complete success is the want of proper preparation of candidates. There is a wide and growing demand for a higher grade of teachers than the district schools can supply.

When High Schools are disparaged on the ground of the limited number going directly from them to college, the fact is overlooked that a large proportion of college students receive their first start college-ward in their local High School. The great advance in the requirements for admission to our colleges has increased the demand for sub-collegiate schools like the Hopkins Grammar School of New Haven, the Free Academy of Norwich, the Suffield, Andover, Exeter, and Easthampton Seminaries, which make a specialty of preparing for college. There is here a great gain in the stimulus and rivalry of large classes, unattainable with the smaller classical classes in local high schools. Those who merely "finish off" for the last one or two years of preparation in some favorite academy, naturally report themselves to the college examiners from the school where they graduated rather than from the humbler High School where their main preparation was really made. Thus, in college statistics the High School fails to get the recognition it deserves.

But it does accomplish a most important work in *discovering and developing* what otherwise would continue latent talent. A scholar does not really know what is in him, what he can be, till he reaches the harder studies and sharper rivalry of the High School. Many a bright but modest and discouraged boy has here been made conscious of his powers, and the assurance that he *can do*, has become the parent of the purpose that he *will* do. Many gifted minds thus roused to higher life ultimately fill positions of great usefulness whose talents would otherwise have been buried in obscurity. Those who have risen to be the benefactors of the race have come as often from humble cottages as from princely palaces. Indeed, history proves that from the industrious classes have arisen by far the greatest part of the energy, talent and genius that has enriched the world. Says Dr. Leonard Bacon, "It is for the interest of the State that no talent which God gives to any child should be lost. If a poor boy, the child of a dependent widow, or an unfortunate immigrant, has any extraordinary talent which being developed would add to the wealth and welfare of the State, and if that talent, for want of opportunity to discover itself, is lost, like a gem in the unfathomed caves of ocean, the State is the loser."

The wealth of a State consists in its *men*, in its treasures of *mind*. True men are worth more to it than money. The man who rears a large family of well trained children renders a greater service to the State than the millionaire who leaves untold wealth to unknown heirs. No town, city or State can afford to abolish its High School. Liberal and wise expenditures for education always prove profitable investments. It has been well said, "taxes raised for purposes of education are like vapors which rise, only to descend again in fertilizing showers, to bless and beautify the land." Though apparently the work of to-day, the High School is really laying the foundations of the social fabric for coming generations.

If New England is to maintain her influence, certainly the opportunity for a High School education should here be held as the heritage of the people, alike their interest and their right, the source of private thrift and success, and of public safety and prosperity. While the center of population and power is rapidly drifting toward the far West, New England can maintain her influence only "by better education of the people, better intelligence, better skill in the arts of invention and discovery, and in the processes and economies of production," and all these are dependent on our schools.

The education which was ample for our fathers is insufficient for their sons, who must be better equipped for the sharper conflicts and rivalries of modern life, or failure awaits them. Men who were relatively prominent fifty or seventy years ago could win no success to-day. The business and industries of the country and of the world involve far more application of science and skill than was demanded then. Our modern civilization requires enlarged *opportunities* of education for the whole people. The rivalry of States and nations hereafter is to be in inventions, in technical skill and in the dignity and efficiency of labor. The great international expositions of industry during the last twenty years, especially the Centennial at Philadelphia, and the last Paris Exposition, are bringing the nations of the world into sharper rivalry, and yet fraternizing their diverse peoples, broadening their views, and inspiring them with new ideas of modern civilization. The proudest exhibit at Philadelphia, and the grandest product of American Education was the people themselves. This product was as directly traceable to our schools, as were the fabrics there shown to the mills that made them. That so many millions of people attended our exposition (over 260,000 in a single day), not only without violence, but showing proofs of self-command, decorum, and education, reflected more honor upon our nation than did all the works of art and inventive talent there displayed. Visitors from abroad were struck by the self-poise and orderly bearing of our people, and by the absence of the gendarmes so conspicuous everwhere in the old world. Nowhere in Europe would so large a throng be allowed to assemble without the presence of the military which ever masks the necessity of thus guarding the State under the semblance of giving eclat to all public occasions. The public school was a leading factor in the results seen in all our broad displays of inventive genius. But for the work which the American High School has done, Machinery Hall would have been meagre in size and mean in its exhibit. Our country has been already enriched by its High Schools. The money expended for their support has proved a wise and profitable investment. Their results show that they are demanded by a true and intelligent regard for the material interests of the country.

A Pittsburgh writer, with no Puritan proclivities, says: "New England early adopted the theory that it is the duty of the State to support both common and High Schools, and as a result of that education she presents to-day the most prosperous, intelligent and the freest people on the face of the globe. Can her prosperity be justly attributed to any other cause? Her climate is cold, her soil barren and stony, and she possesses but few of the natural advantages which are the pride of other States. Compare this section with the two Virginias, States possessing as many natural advantages as any others, and see if the great difference in their prosperity can be attributed to any other cause than their difference in education. The area of New England is about the same as that of Virginia—a little over 60,000 square miles. The population of New England is over 3,000,000, while that of Virginia is but one and a half million." A striking illustration both of the difference and power of public sentiment on education was furnished nearly two centuries ago by the replies given by two American colonies to the English Commissioners of Foreign Plantations. The Governor of Virginia replied, "I thank God we have no free schools or printing presses, and I hope we shall not have these hundred years." The Governor of Connecticut answered: "One fourth the annual revenues of the colony is laid out in maintaining free schools for the education of our children."

The main argument urged by the ablest opponent of our High School system is that it is *communistic* in its principle and tendencies. When I advocated the passage of a Free School Law in Connecticut a dozen years ago, the bugbear of Communism was the main reliance for the defence of the old and odious rate-bill. Free schools would surely encourage socialism in its most baneful form. Time tests all theories better than arguments. In Connecticut a decade of free schools has witnessed no new tendencies to communism. Recent elections in our State showed plainly the popular dread of all socialistic dogmas, which were repudiated alike by both political parties. In Massachusetts, where free High Schools have been maintained for more than two hundred years, there is as little socialism as in any land in the world. Throughout the Eastern States there is no tendency to communism among the descendants of the genuine New England stock. The minimum that exists, is limited to a small fraction of the foreign element. Though curiosity attracted crowds to hear Dennis Kearney in the autumn of 1878, it is due to the intelligence of the people, that his communistic tirades disgusted all classes, and prompted the candidate who first sought his alliance to disown his dogmas and disfellowship him.

Communism is an exotic in this land. It does not easily take root in our soil, and our climate is uncongenial. Its chief advocates are *homeless* foreigners. Even the immigrants long domiciled here have become so schooled by public sentiment, and by our free institutions, as to be well nigh assimilated and Americanized. Schools and the diffusion of property are our safeguard against socialistie extremes. In like manner, Switzerland, with institutions free as ours, is safe from communism, for she has free schools and the general ownership of land. Her common schools are absolutely free and her High Schools charge a merely nominal tuition. Twenty dollars a year admits a Swiss even to the National University. The Internationals may meet in free Switzerland and nobody is frightened or disturbed by their vagaries. The communism now rampant in Germany certainly cannot be due to free High Schools, for her gymnasia and all higher schools charge tuition, and only the lowest grade of schools is free. Her vast standing army, with its enormous expenses and exactions, repressing the liberties of the people, crushing their industries, embittering their social life with sharp class distinctions, and transforming the whole population into a camp, has created a great revulsion of feeling. The glory of conquest, and the untold milliards of the French Indemnity, mainly expended on new fortifications now bristling with cannon, do not atone for the mourning and bereavement brought to so many desolate homes. The heavy burden of taxation, the dread of conscription, the fear of new wars, and the inexorable law that every boy shall spend three weary years in the camp, and the countless and constant other reminders that the empire rests solely upon force, naturally exasperates the people *because* it looks to force alone for its supremacy.

It is objected that High Schools tend to pauperize the people, providing a kind of alms that no one can accept without impairing his manliness and self-respect. But the High School is no more a charity than is the free public road or bridge. It is the interest of the State to adopt those plans which will promote the greatest good for the greatest number, and especially to furnish substantially equal school privileges to the children of all classes. If I never use the mails, I may not oppose the support of the postal department by the general government, since it contributes to the highest good of the nation.

The right of a State to self-existence implies its right to sustain such schools as are essential to its preservation and prosperity. States and towns have the same right to support High Schools as common schools, for the former provide the best and cheapest means of increasing the efficiency of the latter. The State need not and should not interfere with those enterprises and institutions which are likely to be amply supported from the expectation of gain, but all history shows that both high and common schools are not of this class. Of physicians, lawyers and ministers, the demand will create a supply, but this is not so in regard to schools and teachers, for the need is least *felt* where that need is really greatest. One of the baneful and blinding effects of ignorance is insensibility to the evils it induces.

Educational taxes are founded primarily, not on the idea of benefiting parents and children, but the broader view that the State has a proprietary interest in all persons and property within its bounds, and especially has a stake in her youth that they may be well qualified for her service, whether that shall be civil or military—on the farm, in the factory or counting room. It was the better education of the masses in the North that saved the Union during the late civil war, as it was the ignorance of the "poor white trash," making them the dupes of ambitious leaders, that rendered the rebellion possible in the South.

An eminent opponent of High Schools, discarding the idea that the republic can be saved by the general diffusion of primary education, advocates the special training of the wealthier and higher classes to become leaders of society, as "there is power in the spread of higher education and the sentiment of honor associated with culture." But invaluable as is the highest culture, the general diffusion and equalization of intelligence is far more essential to the public welfare than the highest culture of a few aspiring to be leaders. Disseminate general intelligence, and men of special gifts will arise, called out by special emergencies. Thus you avoid the tendency characteristic of all past history, to separate society into diverse strata, "in which a favored few and the masses figure as extremes of intellect and ignorance, leadership and vassalage." In America, experience has proved that it is safer to trust the people than the politicians. Our intelligent yeomanry are, as a rule, just in their sentiments, and their honest judgment must in the end govern those who aspire to be leaders. Some, boasting of rank or fortune, proud of their aloofness from the masses, deprecate this equalizing of conditions which is the glory of the American High School. But in this democratic country such snobbishness is beneath argument or notice.

It benefits all classes thus to mingle together. Those whose temptation and weakness come from undue reliance on rank or riches, may learn a needed lesson of humility and energy, as they wrestle with some bright and studious sons of penury. On the other hand, the boy all his life, pinched by poverty, dispirited by his *hard* lot, his humble parentage, his plain home and plainer garb, gets a beneficent lesson of hope and encouragement, as he wins the prizes for scholarship. The High School is truly democratic, it is a great leveler, and the best of it is, it always *levels up.* Money and station no where count for less than in the recitation room. Here caste is unknown. The children of the rich and poor sit side by side, and work hand in hand, forgetful of all social distinctions. That privilege, to my certain knowledge, has gladdened many an obscure household. The richest prizes I have often seen carried to the humblest homes. For in my official work it has been my duty—or rather privilege—(and I ought not to think myself a disciple of him who ever went about doing good, unless I deemed it a privilege), to mingle much with the masses,—with plain people. My sympathies have been deeply enlisted as I have often found among their children earnest scholars, gifted by nature, eager for improvement, hungering and thirsting for knowledge, against whom, if you close the High Schools, you bar the way to further progress.

It should be frankly admitted that some errors of School Boards have given occasion, if not good reason, for dissatisfaction and complaint. In some High Schools the curriculum has made them seem to be mainly feeders for the colleges, merely preparatory departments for higher institutions, prescribing studies of little practical use except to those who complete the course.. However close the sympathies of High Schools may be with colleges, their sympathies should be still closer with the general public, for the great majority of their scholars are preparing, not for college, but practical callings upon which they will enter on leaving the High School. There should therefore be provided two courses of study—one full and complete for those who evince the fit taste and talent therefor, and another designed for those who can take but a partial course.

It is a serious mistake to encourage all in these schools to study Latin or Greek. So far from disparaging classical culture, I hold that there is no substitute for it in a *full* course of study. But with the certainty of premature graduation of the majority who enter High Schools, I strongly condemn the practice of merely beginning the ancient classics or any modern language, when the pupils' circumstances and settled plans permit only so brief continuance in school that this smattering of a new language is gained at the expense of more essential and practical learning. This common error is due to the ambition both of scholars and teachers, the one aspiring prematurely to pursue high sounding studies, and the other eager to swell their classes in the classics, as if the reputation of their schools was to be measured by the number of their students in Latin and Greek. Sometimes a graduate fresh from college, well up in the classics, eloquent on the advantages of their study and ambitious to be a classical teacher, makes a whole school giddy with dreams of Latin lore. To guard against such mistakes and test the adaptations of pupils, I recommend that the first two or three months in the High School be devoted to a review of English branches, and that none begin the classical course without a written request from their parents or guardians, and without showing aptitude for such studies.

A little preliminary drudgery over the Latin Grammar and First Lessons, with no such facility in translation, or insight into the forms and philosophy of the language as to make it valuable as a discipline, or suggestive in other studies, to be dropped forever when school days end, will poorly compensate for the practical sciences thus displaced, or for that study of our own language and unequalled English classics which would foster a love of literature, healthful and lasting as life. It should always be kept in mind by both scholar and teacher, that the object of the High School is not to finish the education of any one, whether his course is partial or complete, but to lay the foundation for future and higher attainments, to teach the pupil *how* to study and inspire him with love of learning. If this be done, he will for the rest, educate himself, fully realizing that his education is only begun when his school days are ended. To complete it, will be the ambition and pleasure of his life. Place him where you will, let his calling be what it may, he will find leisure for study, and occupy the intervals of labor or business engagements in the cherished work of mental improvement.

While the study of ancient or modern languages is to be discouraged where school privileges are to be limited, a taste for English literature and the natural sciences can be awakened with a reasonable prospect of continuing the study in after life.

The most plausible objection to High Schools is that they tend to make the children of the masses discontented and averse to manual labor. So universal is the necessity of labor, that this charge—were it true, should everywhere condemn these schools. Nature and history alike confirm the old decree, "in the sweat of thy face, shalt thou eat bread." But it is a great mistake to suppose that education *need* create any aversion to labor.

Under the old system of slavery in the South and serfdom in Russia, and in relation to the equally illiterate farm hands of England, it was held as an axiom that schooling would make laborers discontented, restless and unprofitable servants. But education may be the auxiliary of labor. In room of the silly and baneful notion that labor is menial, or a degrading drudgery, education may render it more productive, profitable and inviting. More should be said and done in our schools to dignify labor, and train our youth to become cunning craftsmen. Pride in one's work leads to higher excellence, both in his craft and character. The artizan who delights to do his best to-day, will aspire to do still better to-morrow. On the other hand, the theory that labor is a degrading drudgery will demean any artizan and bar improvement in his trade.

Thus Germany, where education is carried to the highest degree, honors and encourages industry. In like manner in America the great problem of our day is to elevate work by first educating and elevating the workman. We are, or certainly should be, a working people, and the cause of the workman is the cause of all. The masses are learning that mere muscle is weak, that brains help the hands in all work, that knowledge multiplies the productive power of labor. If knowledge is power, ignorance is weakness and waste. What a man *is*, stamps an impress upon what he *does*, even in the humblest work. Whatever elevates the laborer, improves his labor. You can dignify labor therefore in no way so surely as by educating and elevating the workman. The wealth and welfare of individuals and states, always dependent on labor, can be most fully secured only by educated labor. If rightly conducted, therefore, our High Schools, so far from breeding discontent with the humblest pursuits, will prepare for success in the ordinary callings of life.

To intelligent foreigners, our High Schools present a most striking feature of our educational system. The recent report of F. Buisson, of the French Commission appointed to examine the American School System, comprising the fullest and ablest investigation of this subject ever made by any European, gives an interesting description of our High Schools, a single paragraph from which deserves reprinting in this connection.

"No part of the American School System is more essentially national than are the High Schools. No part of the system presents features that are more original, or in some respects further removed from European ideas, no part of the system is worthy of more profound study. Peruse the course of study in these High Schools, think of those children of workmen passing four or five years in adorning, strengthening and cultivating their minds by studies that everywhere else are reserved for the well-to-do classes, and tell us, if these institutions do not bear the seal and impress of American civilization. Has not the American a right to be proud when he shows us the son and the daughter of the humblest artizan so mentally elevated that between them and the privileged of fortune, no difference of culture is to be discovered? If it is glorious to see society freely giving to the poor the benefits of a public school education, is it not a still more extraordinary spectacle to behold a nation that deems it would *wrong its humblest* citizens, were their children denied *any* opportunity for the full and free expansion of their minds. Here is a country where there are hundreds of free High Schools on the same footing as the most primary establishments. They are not professional schools, but in the fullest sense popular schools, intended to give the *people* the best and loftiest results of liberal education. They open up no special pursuits, they lead to all pursuits, without distinction, forming bright, intelligent youths trained to studies of every kind, qualified to select for themselves among the various callings and skilled to succeed therein. So far as social equality can be reached on this earth, it is attained by the American High School. In other countries, the children of different classes of society, though brought together for a while in the public school, must soon be separated by the whole distance between their respective families. In the United States every effort is made to diminish this separation and to carry as far as possible that common instruction which effaces the distinction of rich and poor. If it be true that the prosperity of a republic is proportioned to the replenishment of its middle classes, then the High School of the United States, whatever it may cost, is the best investment of capital that can possibly be made."

Professor Huxley strongly puts a kindred thought. "No system of public education is worthy of the name unless it creates a great educational ladder, with one end in the gutter and the other in the university."

A paragraph from an address of Ex-Governor Hubbard is worth repeating here: "I want to see labor which is the *first interest* of society, the government, of the world, made to *think* as well as work—to think first for political uses, that it may learn to govern itself; next for industrial uses that the working brain may lend cunning to the working hand, to think at the plough, at the anvil, at the forge, at the loom, as Blanchard thought out the turning-lathe, McCormick the reaper, Howe the sewing-machine, Hoe the printing press, Bigelow the power-loom, Goodyear the vulcanization of India rubber, and Edison's thinking out from day to day inventions and discoveries which almost outrun the dreams of professional scientists. These sons of the common schools are the true artists, and their works the true fine arts of the world, compared with which the so-called artists and fine arts of painting, statuary and music are barren and secondary creations. So then I stand for the common schools as the life of free government, the friend, educator and uplifter of the laboring classes, the defence of the people against themselves, and so in a large sense, a substitute for standing armies, and the best possible solution of the much vexed labor question. Abolish free schools, or starve and cripple them, and free institutions will go down with them. On the other hand, increase the number of High Schools, multiply free libraries, make education not only gratuitous but universal, and you shall have more school houses to build, to be sure, but fewer jails, more Benjamin Franklins, but fewer Dennis Kearneys, more honest voters, but fewer repeaters and ballot-box stuffers, better laws, better administration, and with these, better liberties, better justice and a better social and intellectual life."

High Schools benefit not their graduates only but the whole community. They are essential to the efficiency of the common schools. They promote the greatest good of the greatest number. They are far more useful even than military, naval and agricultural schools. The latter are properly supported at public expense, though attended by very few. The benefit they confer on the whole community, not the number of their graduates, is just ground for their support by general tax. The opportunity of free and full education is the corner stone of American civilization and progress. The present remarkable demand for American inventions, machines and fabrics in nearly all the markets of the world should stimulate increased interest in secondary education, and commend our High Schools more than ever to the hearts of the American people.

On this subject the lessons of experience should be heeded. I give, therefore, in a condensed form the following testimony from gentlemen who have had the widest opportunities of observation in regard to the results of High Schools—

More than all, High Schools are important because they constitute the only trustworthy agency to bring worthy representatives of the lower classes into the councils of the State and the organism of society. Abolish the High Schools and at once you draw a broad line of separation between the rich and the poor. You limit the higher education to the well-to-do, who only have the means to pay for it, and this would prove a damaging venture for the State. Mainly the cultured classes are found to be the governing classes, and among its governing classes society needs the representatives of the poor. It needs them that there may always be strong men coming to the front, with powers so tempered by culture as to make them wise, to represent the humble class from which they sprung, and demand the consideration due to their needs and their rights. These are the men, too, in the social exigencies which sometimes occur, when passion becomes rampant among the masses, and the restraints of law are defied, to throw themselves into the track of the storm and allay its violence. Far better this than the alternative, if you do not bestow the culture; for those who are born to be the leaders of men, will assert their prerogatives, whether or no, and the born leaders from among the poor, if they be not tempered by culture, become the ignorant demagogues, whose leadership is anarchy.—*H. F. Harrington, Supt. of Schools, New Bedford.*

If the High School is open to all, that, in connection with the lower schools, will have a tendency to preserve a republican equality, which is always disturbed when the advantages of a higher education are limited to a few. It is true that not all the pupils of the elementary schools will attend the High Schools, but the latter are open alike to all who choose to avail themselves of their advantages. There will be more educated people in every town maintaining a High School than there would be without it; and the more educated people there are, the greater will be the development of material resources, the more perfect the security of property and of persons, the higher the civilization and the more complete the facilities for the unmolested enjoyment of all the objects of our natural rights.

High schools in our public-school system hold the relation of a part to the whole. Without them the pupils of the elementary schools would be sent out into public life without a proper training of their reflective faculties, and there would no longer be *open to all*, the means of obtaining that knowledge which directs to a successful life. Free instruction in the higher branches of learning is necessary to prevent those class distinctions, that are sure to spring up, if such instruction can be obtained only by a favored few. A republican state and republican society are both impossible unless the children of the state are educated together in the same schools. Rank in human society has nothing to do with the right or the importance of human culture. Wherever there is a human being, there should be furnished an opportunity for the highest culture, and in this country, at least, we should not for a moment admit that the advantages of birth have anything to do in determining what are our natural rights. The laboring classes of the country should be especially interested in supporting the secondary schools, for unless higher instruction is free alike to all, their children may be deprived of it, and with its loss will be taken away the possibility of their holding equal rank with the more fortunate, even in our American society. Give a boy a good education, and, though wanting in wealth or ancestral renown, he will take his place among his fellows, the peer of the richest and the noblest. Hostility to High schools is therefore hostility to the best interests of all classes, but it is *dangerous* to the vital interests of that large class that must depend on free public schools for their education.

The opulent should be interested in these schools, for, by their influence on the education of the masses, the civilization of the state is exalted, life and property are more secure, and all the good ends for which human society was instituted will be more fully secured. Neither private interest nor political ambition, nor sectarian zeal should move us to waver for an instant in the full and cordial support of these educational institutions established by the fathers and which in time of peace and war, in times of plenty and want, have been thus far so nobly maintained by their children.— *Hon. J. W. Dickinson, Sec. State Bd. Ed., Mass.*

The demand for educated directive power is on the increase, by reason of the fact that machinery is taking the place of mere hand-labor; and as a result, a grade of intelligence is necessary that can understand and manage complicated labor-saving contrivances.

If a town sends its own native-born youth into the subordinate positions, and hires at a higher rate of wages the directive skill which is needed to lay out and supervise their work, it will find itself obliged to pay a much higher sum for the supervisory work than would suffice to train its own population for the purpose.

The protection of the community as a social body—its common weal—is now generally recognized as a duty of government as important as the political necessity for diplomacy and military defense. A State that allows its population to be starved into the necessity of migrating to another land, while it could prevent this by founding industries and a system of popular education, violates to its own cost the plain principles of political economy and social science. A State that allows itself to go to decay socially will perish as certainly as if it allowed a foreign State to overrun it.

The necessity of free primary education for social prosperity is well enough understood in the United States, but the justification of free higher education is not understood, although widely conceded. The psychological relation of a knowledge of reading, writing, and arithmetic to the practical success of a common laborer is easily seen by an average mind; but the relation of higher studies to success in directing the labor and in controlling the political policy of the entire community, is not seen except by those minds that can take in and comprehend the scope of the general process which the community as a whole is involved in.

We have heard it said that education unfits the common people for their vocations—that it makes them seek a livelihood in the professions, and causes them to aspire above and beyond their sphere. Nothing could intimate a more profound ignorance of the revolution that is in progress in the realm of productive industry, than this utterance of the opponents to popular education. The progressive change in society involves a process of substituting machinery for hand-labor; hence the change of vocations constantly occurs. The man not able to understand and direct machines cannot gain as a common laborer a decent subsistence. More than this, if he cannot learn readily the direction of a new machine—cannot change the minor details of his vocation—he is liable at a moment's warning to be thrown out of employment by the invention of a new labor-saving machine that will render useless his already acquired skill.

The distress of the laboring population is well known to the students of social science; its chief source is this one of the change of vocation rendered necessary by the progress of invention. Science and the useful arts are making sure advance at an accelerated speed; the emancipation of the race from drudgery, on the whole, is rapidly going forward; but the uneducated laborer—that is to say, the laborer whose education is only special, and includes only a form of skill or of manual dexterity, instead of a general intellectual training—is continually thrown aside, just as antiquated out-of-date machines are thrown into the lumber-room. Ability to reädjust one's vocation belongs only to those who have general intelligence—such intelligence as school-training gives, or rather such as the insights of science give, whether acquired at school or elsewhere.

This general consciousness of the possibility of rising above the stations into which they were born is the heritage of all people who know the meaning of the new industrial evangel that Providence has sent to this age. The conquest of nature, the subjugation of the forces of nature and their employment to provide the means for food, clothing and shelter—the three material wants of man—keep equal step with the march of science. The individual laborer is continually pushed upward to vocations that are ministrative to the spiritual wants of man—those of amusement and culture—and to such material vocations as require more intellectual versatility and alertness of mind.

Our systems of education not only do not over-educate the children of the people, but they scarcely equal the most urgent demands of society. Every day it happens that society suffers by the incompetence of persons in places of directive power; every day it suffers by reason of the inability of the human laborer to reädjust himself to the rapidly-moving tide of productive industry that makes his vocation no longer needed. More general culture—the elevation of all minds to the plane of generalization, of thinking-activity instead of mere imagination and conventional opining—is what is required.—*W. T. Harris, Supt. of Schools, St. Louis.*

It has been objected that "the High School provides facilities for education which the common people do not need and ought not to have. Too much education makes a man restless and discontented with his inevitable lot, and makes him disinclined to labor. Man was born to obey, too much education makes him self-important, ambitious, unwilling to obey, but desirous to command." Most of those who thus say there is too much education for the masses are, in principle, monarchists or oligarchists who believe in the divine right of the few to rule the many and who hold that "the minimum amount of education that will make good citizens is the maximum amount which the State may give, and the knowledge of the primary branches being all that is essential to good citizenship, the State may furnish this and nothing more." The grand purpose of life is not that we may be governed, not that we may govern, but that we may become happier, wiser and better, and all associational enterprises should have this end in view. But how much intelligence is necessary to enable a man to perform the functions of citizenship? The intelligence that manifests itself in a wise system of laws must necessarily reside in the people. Good citizenship requires intelligence enough to make good laws and patriotism enough to obey and defend them. To obey is the duty of *the subject*, neither great wisdom nor a high degree of civilization is necessary to perform this duty. An ignorant man can be a good subject, thinking the opinions and executing the will of others, but he cannot properly execute the functions of good citizenship. The highest form of citizenship necessitates the highest form of intelligence. A limitation of intelligence is necessarily an abridgment of citizenship. Every voter of the State is a lawmaker. He expresses his thought through the ballot, and thus his intelligence manifests itself in the laws of the commonwealth. The more intelligence we put behind the ballot, the more stable will our institutions become, and the more ignorance we suffer behind the ballot, the sooner will they show signs of weakness and decay.

It is objected that only the *rich* few enjoy the advantages of the High School. But the claim that it is patronized by the wealthy and not by the poor, is wholly without foundation; in fact the majority of its patrons are of the poorer classes. It may be said that this is an argument which the large taxpayers may turn against the High School. But it is one of the best agencies by which property is protected. Every poor man knows that his boy has an opportunity to occupy a higher position in life than he occupies himself, he knows that means are provided by which his son may have an equal chance in the race of life with the son of his wealthy neighbor. This is the chief glory of our country, and this feeling, more than anything else, makes him a good citizen, contented with his lot. He feels that the government does something for him and more for his children. This makes him obedient to the laws and a patriotic defender of them when they are assailed. Take away the hope of the poor man that his child may occupy a higher position than his own, and the rights of property will not be as secure as they are today. The High School is one of the means by which the sons of the poor may climb up in the world. If the wealthy pay for the High School, it is a good investment for them, for it is a better protection to property than a thousand policemen.—*James H. Smart, Supt. of Schools, Indiana.*

The High School may educate a small percentage of our youth and still be a necessary agent in the system, reflex in its influence on the schools below it, elevating their scholarship, inciting their pupils to high endeavors, and furnishing to the aspiring and energetic a culture, without which their intellectual progress would be arrested at a very early stage.—*Hon. D. Burt, State School Supt., Minn.*

The usefulness of the High School is beyond expression, wielding an influence for good over the district schools of the town—an influence which would not be seen except for its presence. There would be, of course, excellent district schools without it, but not as excellent or as perfect in their usefulness and work. The High School beyond them of necessity makes their undertakings more active and more substantial. Their scholars look forward to the High School as a goal to be obtained, and their teachers give them all aids within their power to render them successful in reaching it. If there were no other influences which it exercised but this alone, the High School would be worth unmeasured values for the cost at which it is maintained.—*J. H. Brocklesby, Acting Visitor, Hartford.*

The wisdom of the establishment of the High School becomes more and more apparent. If argument were needed for its continuance and liberal support, this is found in the stimulus it presents to the pupils of the Grammar Schools for faithful work, in order to get the benefit of the higher training. The graduates of the school will furnish the other schools with teachers as vacancies occur, so that we shall not need to look to other places for a supply, as has been necessary in the past. —*H. M. Harrington, Supt. of Schools, Bridgeport.*

The members of our High School are largely composed of the children of the poor, and in scholarship they are equal to the children of the rich. Many of those who are now pursuing their studies in our schools are fitting themselves for positions of usefulness which would have been entirely beyond their reach if it had not been for these beneficent provisions.—*Geo. W. Pike, Acting Visitor, Killingly.*

The Legislature of Rhode Island not long since instructed its committee on education to inquire and report whether the public money now expended on High Schools might not be used otherwise more to the public advantage. The report of the committee in response to this inquiry stated that "The higher education is the fountain of popular education. In all countries where great success has attended the efforts to instruct the masses, it has been due to influences emanating from higher seminaries of learning. Whatever influences operate detrimentally to the High Schools, in the same degree militate against the real efficiency of the elementary schools."

THE

ORGANIZED
OCT.
1878.

WEST EWING

IMPROVEMENT

ASSOCIATION.

Proceedings of Anniversary Meeting, held in Ewing Church, Sept. 2d, 1880, and other valuable matter.

TRENTON, N. J.:
MAC CRELLISH & QUIGLEY, STEAM POWER PRINTERS.

1880.

Entered, according to act of Congress, in the year 1880, by the
WEST EWING IMPROVEMENT ASSOCIATION,
P. O. Address, Greensburg, Mercer Co., N. J.,
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HARVEY EDW. FISK,
GREENSBURG,
MERCER CO., N. J.,
OR, P. O. BOX 235,
NEW YORK, N. Y.

OUR MOTTO.

"One for All and All for One.'

OUR PRIZES.

I. This Association offers to the resident of Ewing Township who shall set out and maintain the longest and best row of trees along the public highway, in conformity with By-Law II, or the recommendations of Mr. Northrop's address, a PRIZE OF TWENTY-FIVE DOLLARS, payable September 1st, 1881.

II. This Association offers to the Board of School Trustees of either the Scudder's Falls, Birmingham or Brookville District, which shall effect the greatest material improvement in or about the school-house of their district, before July 1st, 1881, a PRIZE OF TWENTY-FIVE DOLLARS, payable on that date, and to be used by the Trustees receiving it for further improvements of an æsthetic nature.

See, also, By-Law I.

THE
WEST EWING IMPROVEMENT ASSOCIATION.

ANNIVERSARY MEETING.

PHONOGRAPHICALLY REPORTED BY GEORGE E. MILES.

The proceedings were opened with prayer by the Rev. S. T. Lowrie, D.D., after which it was moved that the reading of the minutes of the last meeting be dispensed with. The motion was adopted.

The Treasurer, Mr. Charles J. Fisk, then presented his report, which was adopted.

The Committee on Election of Officers then reported, through its chairman, the following names for officers of the Association for the ensuing year:

President—A. B. Green.
Vice-Presidents—Wm. A. Hough, John H. Scudder.
Secretary—John V. Green.
Treasurer—Chas. J. Fisk.

The report was accepted and the officers named were declared elected.

The President, Mr. A. B. Green, in introducing the first speaker, spoke as follows:

It may be well to state that the object of this meeting is to further the cause we are engaged in as an association. The object for which the Association was established two years ago is well known, probably, to all. It is to beautify our homes in the neighborhood, and make this township a more pleasant and desirable place to live in. We have accomplished something in these last two years. Through our direct influence about two hundred shade trees have been set out along the roads and sidewalks. We have made a piece of road which we think is a pattern for the whole county—a road which formerly bore the reputation of being the worst in the place. We have found, in conferring together, that much yet remains to be done, but we are assured that, by co-operation, we can do still more. The setting out of these two hundred trees has been done with great cheerfulness, mostly by people owning the property on which the trees are planted, and as the work proceeds I suppose greater interest will be excited. The road I mentioned a moment ago has cost the township nothing, having been made by voluntary labor and subscription. It is true that prejudices have existed in our community, as I suppose they exist in all. These are a great hindrance to our progress; but we can overcome them by union among ourselves and interchange of views and plans. We are, of course, very tenacious of our own opinions, and think we know a great deal about how this, that and the other thing ought to be done; but, after all, we must admit that our own wisdom cannot be compared to the long experience of those who have carefully studied and scientifically investigated the matter. We find ourselves, by frequent comparison of views, more and more of a like opinion; we establish and improve our social intercourse. One gentleman will be found to know better than another how to plant a tree, or how to trim one; another knows better how to plant or trim a hedge; some lady possesses a rare flower, or knows precisely how to raise one, and through our monthly meetings we gain this varied knowledge and profit by it.

We could name instances where the conditions of health have been improved, but, inasmuch as we have others with us who can instruct us on these important topics, we will listen to them, and we hope, through the dissemination of such ideas, to see more unite with us, until it becomes the interest and business of the entire neighborhood.

I have the honor to introduce to you the Hon. B. G. Northrop, Secretary of the Connecticut State Board of Education.

Address of Hon. B. G. Northrop.

Mr. President, Ladies and Gentlemen—It seems to me very fitting that the gentlemen who served so successfully during the past year should be unanimously re-elected; and if you will only tell us how it is that such nicely-made roads as those you have been completing the past year could be made for four dollars out of the treasury, we would like to carry the art into Connecticut, for it certainly costs *us* a great deal more. I have been delighted—first, in seeing what the plan is, as stated in the village improvement paper, and then in driving about the town this afternoon and observing what has actually been accomplished. I congratulate you on your complete success in driving out of Ewing the "placard" nuisance, or advertising fiend; for I have not seen a single one of those abominations —which in Connecticut are prohibited by law under severe penalties—on any fence, or barn, or board, anywhere in the drive which it has been my privilege to take. I am very glad to see that already you have planted so extensively the fine Osage orange hedge [See Note]—perhaps, for this climate, one of the very best, and one which in future will be a great adornment to the place; and that you are starting so grandly in the planting of trees; and I am pleased, also, with the statement just made that nearly all the trees planted have been set out by the farmers who owned the adjoining land. You are indeed to be congratulated that such a forward step has been taken in the very important matter of roads. [See Note.] The *road* has been, in all ages, the index of the civilization of any country or community. If we had no other remains of the civilization and intelligence of the ancient Roman Empire, its grand, old roads, as they still stand, would tell us the story; for they show the highest of all ancient civilization. If there is progress in any community, the roads will indicate the fact. I have been glad to see, as at Scudder's Falls, so much improvement made around the school-house by the introduction of that neat hedge of American arbor vitæ. It was cheering to notice that on the lawn at the left side as you come out (which the children had been requested not to tread upon), not a foot-fall, or a trace of one, was impressed on that ground reserved for turf.

I noticed, on the way up from New York City, very beautiful adornments around many of the railway stations on the line of the Jersey Central. That is one of the improvements which, I have no doubt, you will incite the railway managers to apply here. You are doing so much for yourselves that it will be a very little thing for you to ask the corporation to appropriate a section of land here and there, at a station which is to become so important in the future, for the purpose of a park. I was delighted the other day, traveling along on the Shore line, to find a beautiful little park at the railway station of Brockton, New York, on the Lake Shore & Michigan Southern Road. I said to the depot agent, "How is this?" He replied, "The superintendent desires us to improve our grounds." "How does he communicate that desire to you?" "Well," said the depot agent, "he sends out a printed circular." I afterward secured one of these circulars, and it read as follows: "The depot master is required to occupy his leisure, and the leisure of the hands, in adorning the grounds, and to see that there is no rubbish or disfigurement anywhere around the railway station." As a result, this depot agent had developed that beautiful little park. I counted there two hundred and forty-six flowers of different kinds, besides some thirty different varieties of trees. It was a gem. Other railways are beginning to do the same thing. North Conway and Plymouth, in New Hampshire; Stonington and Pomfret, in Connecticut; Auburn and Kingston, in Rhode Island, are good illustrations. The Pennsylvania Central is setting a good example all along the line for forty miles west of Philadelphia; and a little persuasion on the part of this Association will carry the point with the railway managers at this depot.

On conference with friends here, I think it better to have an off-hand talk with you, and, therefore, throw aside the written lecture which I had arranged to deliver.

The question has been asked, What has been done in the way of rural improvement elsewhere? and I say "rural," rather than "village" improvement. I discard the word "village," for in towns where I am working, I want to carry out the idea that this business concerns everybody in the township, and we cannot bring about the best results unless we benefit all sections and all classes, and thus secure the co-operation of every citizen. I want every one, however distant, to feel that he has some, however remote, concern in this rural improvement. What is the history of these associations?

1. The first rural improvement association, so far as I know, was formed in New Haven, in 1799, under the lead of James Hillhouse, the leading subscriber and manager. He called it the Village Green Association, and secured a subscription of $1,500. One man, in the generosity of his great heart, subscribed five gallons of rum—as good as gold, according to the theory of that day. You may be sure it was not benzine, as you cannot, what you get now. What has been the result of that grand enterprise? Why, all the majestic elms, nearly, of New Haven were planted then; and it is due to that Association, started at that time, that New Haven is known throughout the land and over the world as the "Elm City," while its beauty, acquired through these magnificent trees, has attracted great numbers of wealthy citizens, so that the annual taxes on the property there attracted by the existence of the great elms exceed by far all that the elms ever cost.

As far as I can learn, the next volunteer association was founded about fifty years ago, in Heidelberg. Suffice it to say, the efforts of that association in rebuilding the old castle, and repairing the magnificent drive-way up to it, is the secret, together with the planting their beautiful avenues and parks with fine trees, of the fact that you find, on an average, eight hundred English residents there, to say nothing of the hundreds that flock there from other sources. To name two or three other European illustrations—many of you have seen how attractive Baden-Baden and Wiesbaden, in Germany, and Interlaken, in Switzerland, have been made by similar rural adornments. The Swiss understand making their homes attractive. Out of 485,000 households, about 465,000 in Switzerland are householders. You cannot match that in America; and there are no people on the face of this globe, unless it be the Japanese, who love their country more, and are more devoted to its interests, than are the Swiss.

More than a century ago, a grand work was accomplished (though not by a rural improvement association) in a town in Connecticut, which was a subject of conversation at the dinner-table to-day, and thus was brought to my mind. It was the town of Stratford. Dr. Samuel Johnson, once rector at Stratford and afterwards president of Kings College (since the Revolution, Columbia College), New York City, visiting England and the estate of Alexander Pope, at Twickenham, was struck with the beauty of the Syrian willow growing there. The tradition is, that about a hundred and fifty years ago, an English merchant doing business in Aleppo and Smyrna, brought the poet a package of figs incased in a basket of unpeeled osiers. Noticing that one of the scions penetrating into the moist figs was budding, Pope carefully planted it. Thence grew the famous Twickenham willow that became a favorite with the poet, and finally with the English people. President Johnson brought scions to Stratford, whence it was widely spread through New England and New York. This incident intensified the interest of the Johnson family in tree planting, who took the lead in this grand work in Stratford. No town of its size on the Shore Line, between New York and Boston, is adorned with so many stately, ancient trees as this. Much as this willow was admired for private grounds, with its long, drooping pendants, it was not deemed best for public streets, for which the elm, maple, plane, and other natives were wisely preferred. Now there is nothing but its broad avenues adorned with noble trees, especially to distinguish Stratford from any other of a dozen places along the Shore Line; but, notwithstanding the nuisance of mosquitoes (bred in the adjoining salt marshes), Stratford has attracted many wealthy men, through the exceeding beauty of its streets and avenues. No one goes there without offering up a sentiment of thanksgiving to old Dr. Johnson for the controlling influence he exerted in the beautifying of the town.

But of more recent improvement associations, Stockbridge, Massachusetts, was the pioneer, and that one was started by Mary Hopkins, the niece of President Mark Hopkins, of Williams College. There was no general law of incorporation at that time, but a special act was passed, and that has been in operation some twenty-eight years, and what has been the result? When the association began its work, Stockbridge was a wild, rugged place. I remember it when, in my boyhood, I traveled through the Housatonic valley. Now it is, by far, the most beautiful town in all New England. When Miss Hopkins, now

Mrs. J. ~~C.~~ Z. Goodrich, inaugurated this association, (and it may be a good hint to continue this plan of having an annual festival,) the idea was adopted of having, on the fourth Wednesday in August, a gathering of the people from all parts of the town, on a common platform, without reference to party or denomination, and that idea has been carried out and kept up to this day. They claim that nature has always smiled upon them, as she does upon you this afternoon, and that they have sunny heavens above them on anniversary day. They have had poems, addresses and post-prandial speeches, and the re-unions have done them good, and stirred them to new enterprise and energy.

One of the grandest results of these associations, as it should ever be, is the promotion of fraternal feeling. In many country towns there is needless strife. Such alienations destroy the charm of country homes. Everything should be done to bind the people together in the ties of a common interest, and you can do that in no way so well as by bringing them to work together, as you are working for yourselves. The beautiful decorations of this church to-day are profuse beyond what I have ever seen. I perceive in each of the slips two or three bouquets, besides the ferns and other flowers, and these fitting symbols of the sheaf of wheat. I say this does you good. It has benefited the ladies whose labors have accomplished this result. The interests, the sympathies, the friendly feelings of this whole community, have been drawn out, and they will be more likely to co-operate in the good work for improvement; and I feel sure that this sacred place, instead of being desecrated, is hallowed by its occupation at this time, for a purpose so entirely in unison with all the sacred designs of the church.

I happened to be called upon to give the anniversary address at the quarter-centennial at Stockbridge, and as the Treasurer read his report, after giving certain details he said: "Every acre of land and every homestead in Stockbridge has appreciated by reason of the work of this association." As many of you know, wealthy men have been attracted thither from far and near. Meeting a wealthy New York merchant, known to many of you, up there, one day, I said: "What brought you here?" "Well," said he, "I happened to be passing through Stockbridge, one Summer, and I noticed how neat the streets were, and how the grounds and surroundings of the houses were adorned, and I thought a home here would have increased attractions and a higher value." And so he put up his elegant mansion there, and the same has been done by many others, and Stockbridge is full of the homes of wealthy people.

What has their improvement association done there? They first looked out for the planting of trees, and after all the streets were amply supplied, they turned their attention to the sidewalks. Every one agreed there to look out for his own frontage. I remember driving around the place on one occasion, with the lady who founded the association, and if anywhere, three, four, five or six miles away from the center, she found weeds growing in the road-way, she jogged the memory of the farmer, and the road was cleaned by those who owned the adjoining property. That will be the result in Ewing. I noticed, in driving along to-day, that in a number of roads where you have put out lines of trees, there are some ugly weeds growing alongside the fence, It will be a very easy matter to have those cut down once or twice or thrice a season, and it will add greatly to the beauty of the place. They look out for that at Stockbridge, and, as one thing led to another, there soon came along a former son of Stockbridge, and, seeing what had been done, he said: "I must have a hand in this," and so he gave them $20,000 for a library. Another man said, "I will join in this good work, and give them a library building." So they have there a beautiful library and reading-room, and keep it in operation. It all springs from the interest awakened among the whole people, by a village improvement association. I have no time for further details regarding the work of this enterprising organization. I have talked at their anniversaries many times. I have found them all aglow with enthusiasm.

Ten years ago, visiting New Milford, Connecticut, I met there two young ladies, to whom I said: "You ought to start a rural improvement association here." They decided to do so, and set to work. I gave them the plans. They got up a fair that netted $800, and what has been the result? From a rough, rugged town, New Milford has been made the most beautiful town in the State of Connecticut. No town in the country, in the same limits of time, has made such a complete transformation. There was a wide street, but the carts, crossing in all directions, had cut the road up. In wet weather a brook ran through the center; in dry times there was an unseemly line of mud. They ran a sewer through the whole, leveled the ground, enclosed it, made concrete sidewalks, and a little ribbon of lawn between the fences and the sidewalk and between the sidewalk and gutter. Then came the drive-way on each side, and a parallelogram was formed, and adorned with flowers and trees. I was in New Milford the other day, and a prominent gentleman said: "Well, we spend money pretty freely, but nobody grumbles." It has not been done from taxation at all; all is voluntary; but no one would go back to the barbaric condition that existed ten years ago, even were it necessary to spend ten-fold more. As at Stockbridge, they are appreciating the results in the rise of real estate and the increased demand for homes and lands in the town.

Many of you know of the present beauty of Litchfield. Perhaps some of you saw an article in the New York papers some time ago, about the beauty of Litchfield. The place was living on the laurels of the last century, and was going into decay, and everything was neglected; but seven years ago they started an association of this kind. I met, while there, a wealthy gentleman from one of our cities. "What led you to come up here," said I. "Well," said he, "you would not have got me to come up here if the old fogy spirit prevailed as it did ten years ago; but I found there was a new life and interest here, and it was worth while to have a Summer home here." And he erected his stately mansion there, and luxuriates in his delightful home every Summer. Their boarding-houses and hotels are not ample enough to accommodate the parties that desire to go there. Not having the advantage of such sanitary wisdom as Col. Waring would have given them, the place was desolated, needlessly, by a terrible fever, a few years ago, simply through the neglect of drainage. It was the place of all others that ought to be the healthiest; but those very country towns, where there is every opportunity of securing the purest water and best air, sometimes are needlessly ravaged by diphtheria and typhoid fever and other kindred troubles, which proper care and foresight would prevent.

I have in mind a little town in Connecticut—Middlebury—with less than eight hundred population, and very scanty means. I suppose that whole township has not one-tenth of the valuation of Ewing; and yet, by getting everybody enlisted in the cause, and thus, by co-operation, they have improved the village green, and the farmers have taken hold of the matter, and said, "We will have no rubbish, no weeds, nothing to disfigure our homesteads." You will sometimes go to a village and find everything neat, in the main, and yet the homes of some neglectful men will be disfigured by broken cart-wheels, or piles of lumber or chips, or decaying rubbish of one sort or another. Everything of that kind is cleared away from that little village, and, with only a few farmers along the road, they have agreed to keep it in good condition. I might give many other details, but have not time for that.

The question asked me since coming here is, how to raise the funds? Probably you know better how to answer that question than I can tell you, because you have among you liberal men who have already contributed generously to these grand results, and because the detailed plans must always be determined by local conditions; but I say, in general—

1. Enlist the ladies. Many of our most successful associations have been started by ladies, and all need their sympathy and efficient co-operation. I always feel sure of success in any town where two or three earnest ladies take hold of this matter. This is woman's special sphere.

2. Interest the youth of the town in this good work. Give the children something to do in improving the grounds and surroundings of their homes, if not the road-sides. The New York "Evening Post" well says: "They, more readily than anybody else, become interested in such matters, and they may easily be induced to bring trees from the forest, and to plant them where they are needed, without cost to anybody, and without other than willing and eager work. How great the good is that boys and girls derive from *their own active interest* in such things, every attentive observer of youth knows. *The educational effect* of such employments and interests, the refining influence, the æsthetic improvement wrought, the enlargement of heart and mind which grow, directly and indirectly, out of

work of this kind, done by *united* effort by the boys and girls of a town, under the stimulus of public approval, are not to be set down in words or expressed in figures. In any town, where juvenile enthusiasm is awakened in public improvement, the schools will accomplish better results, the library will be more freely and profitably used, there will be less idleness, less wrong-doing, habits will be better, aspirations higher, the tone of life stronger. Every such town must improve in intelligence, taste, public spirit and morality, which is decency of life reduced to principle, quite as positively as it grows in external beauty.

3. Get subscriptions from the more willing or wealthy residents.

4. Invite the co-operation of non-resident sons of the town, whom fortune has favored, who are often glad to gratefully remember the mother soil that bore them, and thus build a monument, each for himself, and be henceforth gratefully recognized as the benefactor of his townsmen and of future generations. A beautiful village of tasteful, happy homes, would be a proud monument for any man. There is a rare luxury in witnessing the fruits of one's benefactions, *giving while living* and able to enjoy the rich results, rather than leaving legacies to be lessened or lost in the wrangles of contending heirs.

5. Money may be raised by the annual payment of membership fees, or by life memberships.

6. In some towns, fairs are held to raise money for this purpose.

7. In some instances, prizes have been offered for tree planting—giving, for example, $75, $50, $40 and $30 for the longest and best rows of trees by any road-side. Two hundred dollars, offered in this way, in one town, stimulated an extraordinary interest in tree planting.

As I have intimated, one of the prime ends which we keep in view in the fifty or sixty associations which we have in Connecticut, is to cultivate public spirit, and foster town pride. These are sentiments of great influence and great value, and the want of them is greatly to be deplored, for it indicates a serious defect of character. The man who does not love to honor and cherish the town that gave him birth, has no heart in his bosom. I have in mind a railway king, a millionaire, who never visits the town where he first saw the light, but leaves his old homestead to decay, and neglect, and slight; and his character corresponds with his actions. The cold, selfish, sinister soul is sterile in heroic virtues, but the sentiment which honors one's homestead and one's town, is noble and ennobling. It is a prime element of true manhood, and has ever characterized the greatest and best of men.

I need not say a word on the prospective influence of this association in promoting public health, when you have secured the services of a gentleman so thoroughly competent to discuss this subject. Some of our country towns, naturally favorable to health and longevity, have suffered fearfully and needlessly from the ravages of diseases, evidently caused by neglect of hygienic laws. In many towns, great improvement has been made in the matter of drainage, removal of waste, and guarding wells and water supplies from impurities.

Your association, starting so vigorously, will, I am confident, accomplish grand results in improving the roads and road-sides and planting trees, not only within your own limits, but in creating a healthy public sentiment which will extend the good work through all the approaches to the town. I would like to have you give an invitation to Trenton to meet you at your boundary line with a continuous line of trees on every road that runs towards Trenton; and I believe that, under the influence of my esteemed friend, the friend and superintendent of the public schools, Hon. E. A. Apgar, Trenton would accept the challenge. There are many pretty towns that give such challenges, one to another, and carry them out, too. It is easy enough to accomplish, if you can succeed once in arousing ambition.

Many of the roads in England and France are made enchanting by these continuous lines of trees. You remember the story of the two men who laid a wager that each could tell the prettiest region in England, and they chose an umpire, and paid him the money. Then each wrote his decision, and, on handing them over to the umpire, it was found that the choice of one was the road from Kenilworth to Coventry, and the other's selection was the road from Coventry to Kenilworth; and the main attraction of this road was the magnificent trees hat shaded the route. Among those trees, some of you will emember that grand old tree, the Cedar of Lebanon. It is not f very rapid growth, but it is worth trying, and your children nd children's children will thank you for it. I have no doubt t may be grown here. It thrives in Philadelphia. My friend t my right was educated at East Hartford, and he remembers he grand old avenues of elms there. I can hardly tell you ow magnificent those triple rows of trees are. When the French forces under Rochambeau were stationed at East Hartord, for their Winter quarters, Rochambeau, according to the raditions of that day, said: "Now, boys, let's give them ~~a~~ pecimen of French taste." Just at that time [redacted] had een in the habit of planting trees on the way-sides in France or hundreds of miles. So the boys set to work and planted hose magnificent elms, which occur at short intervals from Windsor down through East Hartford to Glastenbury. Grander nes it would be hard to find. Thanks to Rochambeau.

One of the aims of village improvement should be the making f sidewalks. There is room for much to be done in that direction here. Perhaps the gravel is not at hand. The ordinary oal ashes spread along, the coarser below and the finer on top, make a very good substitute, and it can very easily and cheaply be accomplished. [See Note.]

To quicken the intellectual life of the people, is one aim of these ssociations. The founding of libraries is an important aid in his direction. The supply of good books increases the demand. A taste for books has been awakened in many towns by a well-selected library, where the improvement has been as marked in the quality as in the quantity of the books read. Such a library naturally becomes the pride and treasure of a town, rendering it a more desirable place of residence and dding attractions to every intelligent home within its limits.

The formation of book clubs favors the intellectual improvement f a community. A score or more associate together and agree ach to pay from one to five dollars a year for the purchase of a sort of circulating library. Sometimes they meet once a month to discuss and vote upon the books to be purchased, thus promoting social improvement as well as mental culture. The books are circulated among the members in rotation, the members retaining volumes each a fortnight. At the end of the year, these books are sold at a low rate, and often to the members, and the avails used for the purchase of other books. The books usually selected are travels, histories, biographies, popular treatises on science and philosophy, and sometimes books of choice poetry and romance. Good fellowship, as well as intellectual improvement, are sometimes promoted by organizing *reading* circles. Selections in prose and poetry, often a play of Shakespeare, the several parts having been previously assigned, are the subjects of careful study and drill. The social influence of these weekly circles is sometimes extended by a rehearsal of a more public character. The support of a village reading-room, supplied with the leading journals of the day —daily, weekly, monthly or bi-monthly—is a good result accomplished in many towns. A course of lyceum lectures is sustained by many rural improvement associations, the profits of which is their "benefit," while the social opportunities thus opened are clear gain.

An annual festival under the direction of the rural improvement association, tends to deepen public interest in this work, and to fraternize the whole people of a town. In some towns, literary exercises, addresses and music fill the programme, and occasionally, though not commonly, a collation and post-prandial speeches become another bond of union and fellowship. In the rigid, and sometimes frigid, state of rural life too often found among us, we need more heartily to cultivate the social amenities and learn the art of "turning work into play." The supposed monotony and dullness of country life drive many to the city. It is wise for our farmers to multiply occasions for social enjoyment. The arbor-day festival may help to counteract the tendency of rural life to isolation and seclusion, lifting out of the ruts of a plodding monotony, promoting neighborly feeling and strengthening social ties. The rural laborers in Switzerland and Germany socialize far more than American farmers. Their festive spirit is a strongly-marked feature of their character. It is manifested in the family, in neighborhood greetings and meetings, in schools, in rifle feasts, in processions, and various social gatherings. They have a passion for nature, and love to frequent their beautiful groves and gardens. This genial spirit is everywhere fostered by music, both vocal and instrumental. As a result, there is an inexpressible something in the German character that carries mirthful and happy childhood into old age, giving an added charm to social life, and lightness and cheer to sober work.

Among the minor aims of these associations is the providing of rustic seats under the shades for the comfort of pedestrians. In the beautiful drive in West Ewing along the Delaware, how pleasantly would such simple seats suggest neighborly kindness and courtesy. Also, setting up watering-troughs for horses, at convenient points, where, from adjacent hill-sides, never-failing springs facilitate this improvement; furnishing plans for rural architecture, and for gates and fences; in securing hedge-rows in room of fences; or, better still, *in villages*, combining to remove all fences, so that the private grounds seem to unite with the wayside in one large lawn; the suggestion of neutral tints for dwellings and out-houses, in place of the glaring white formerly so common; arrest of stray cattle, for strolling cattle usually are, and always ought to be, outlawed; preventing nuisances—one of these is the tearing up the turf fronting a dwelling-house, by inconsiderate road menders. Painting or posting advertisements on the rocks or fences by the myriad nostrum makers is a nuisance in my State prohibited by law,* and it should be everywhere forbidden. The same may be said of the encroachments made upon the highway every time the stone wall or fence boundary is rebuilt. The whole township should show an interest in preventing such curtailment of its roadways. A rural improvement association can develop a public sentiment which will of itself correct these evils without occasioning any neighborhood strifes or alienations. In this matter, the interest of one is the interest of all. The motto of the Swiss Confederacy, "One for all, and all for one," is the true motto for the several districts, and for all the people of a township.

Reading associations increase the influence of an organization of this kind very widely, and lectures as well. Its educational bearing is of the very highest consequence. The *taste* should early be cultivated. It should be held to be a religious duty to love the beautiful in nature, the beautiful in art, still more the beautiful in character; for all the beauties, utilities and grandeurs of nature culminate in the formation of character. In the very structure of our being, God rebukes the ignorance or indolence that so often dwarfs that noble faculty—the love of the beautiful—designed to be an ally of virtue and religion. Your association here will develop in the minds of your children a love of flowers, vines, shrubs and trees, all the stronger because they have helped in planting and cultivating them. In regard to the superior educational influences of rural scenes and scenery and occupations, Dr. Bushnell was wont to say: "In all my reading of history, I do not recollect the name of a truly great man who spent his early life in a great city." Some one said to me the other day, "What about Franklin?" To which I replied: "Franklin grew up in a small village called Boston." It was but a village at that time; and was not incorporated as a city till one hundred and eighteen years after Franklin was born; but would he have been equal to the achievements which the world has admired, if he had been reared in a great city like Paris? Would Washington have been prepared to become the "Father of his Country" if he had been dandled in the lap of affluence in a great city like London?

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*Read carefully the law of the State of New Jersey on this matter.—Ed.

Nature is the great educator; birds, flowers, insects and all animals are our practical primary teachers. Facts and objects as best seen in the country are the earliest instruments for developing the juvenile faculties. In all our history, the country has proved the great school of mind. Here dwell, and for wise reasons here God intended should dwell, the great majority of mankind.

The country sends far more than its proportion of gifted men to the great centers of influence. It is thus continually enriching the cities, for towards them are flowing, like their streams, the material and mental treasures which have their origin in the mountain springs, and without which the cities would die out. A writer in one of our popular monthlies disparages farmers and farming, saying: "I can pick out the farmer and farmer's boys in any assemblage by their manifest boorishness of looks and action. Your farmer's boy is awkward and jagged, like the oak growing in the open lot, while your city youth is trim and graceful like the pine in the forest." After reading that article, I took a trip to Cape Cod, where a fearful storm had just swept the coast and where were to be seen many a pine made the sport of the tempest, but never an oak stirred from its moorings. So your farmer's boy, trained to industry, to economy of time as well as money, will breast a thousand storms, any one of which would upset your tenderly-reared city youth. "It is not in the great cities, nor in the confined shops of trade, but principally in agriculture, that the best stock or staple of men is grown. It is in the open air—in communion with the sky, the earth and all living things—that the largest inspiration is drunk in and the vital energies of a real man constructed." I often advise the wealthy in our cities to secure Summer homes in the country, or to send their children, for at least one entire year, to the country, with its freer sports and wider range for rambles, and, better still, to give one season to hard work on the farm or in the shop. The practical skill thus gained in adapting means to ends, in observing common objects and animals, may compensate for some loss of book learning, and lead one afterward to pursue text-books with greater zest.

It is the interest of the farmers, of all people on the globe, to co-operate in the work of rural improvement. In no other way can you farmers so surely counteract this excessive mania for the attractions and distractions of city life. We need to enforce in the school, as well as in the family, the necessity and dignity of labor, and its vital connection with all human growth and progress and welfare. The theory that labor is menial, that the tools of the farm or a trade are badges of servility, ought to be refuted in our schools. The Hebrews, acting under divine inspiration, trained up their youth to thoroughly learn some handicraft. When proclaiming the gospel for all the world, Paul could, if need be, earn his livelihood by his trade; and his associates did not dream that they were demeaning themselves or their sacred office by resuming their old business of fishing. Why was it that the Great Teacher, whose life was designed to be the perfect standard of duty to all men in all ages, sought out—yes, *sought out*—the humble cottage of the carpenter, and toiled at the carpenter's bench, except that He might reprobate before the eyes of the world this heathenish notion that labor is servile? It will do for the Chinese mandarin, who lets his nails grow longer than his fingers, to prove that he does not work because he cannot. I say more should be done to dignify farm work; and how can the farmer do this better than by interesting his boys and girls in the adornment of the home and the village?

While I feel a grateful pride in the fact that something in the line of rural adornment has lately been accomplished in all the towns of Connecticut, especially around the homes and grounds of our citizens, I do not mean to slacken my efforts till an efficient association is formed in every township. Though this is no part of my prescribed duties, but only a volunteer avocation in addition to my proper vocation, my interest in the work grows with years and results. It is my ambition to do my utmost to improve the homes and home life of our people, and help them to realize that the highest privilege and central duty of life is the creation of happy homes. The multiplied ministries of nature, providence and religion, center in the maintenance of happy homes. The higher aim of the industries of life, whether agricultural, manufacturing or commercial, and the great end for which government itself is worthy to be sustained, is, that men may live in happy homes. "The hope of America is the homes of America." You improve the schools by improving the homes, as truly as you improve the homes by improving the schools.

It was a very fit thing that, in opening this meeting, we should unite in a prayer of thanksgiving to God for our happy homes, and a fit thing to pray, as we did most fervently and heartily, that we might co-operate in the embellishment of our homes; and let me commend to you, my friends, the spirit of that very appropriate prayer. The hope of Ewing is the homes of Ewing, and when every citizen is induced to look out for his own frontage, and his own grounds, this result is, in the highest degree, secured.

It is a grand fact that modern civilization relates to the homes of the people, especially to their health, thrift, comfort, and their intellectual and moral advancement. In former times, and other lands, men were counted only in the aggregate, and valued only as they helped to swell the revenues and retinues of kings and nobles. The government was the unit, and each individual only added one to the roll of serfs or soldiers, but with us the individual is the unit, and the government is of the people, for the people, and by the people. Every influence should, therefore, be employed with us to foster home attachments. On Cape Cod, the other day, I met a widow, who said to me: "I have not heard from my boy for twelve months, but I know he hain't spoke ship," and she pointed to the flowers and shrubs that her boy had helped to plant; and I knew he had not spoken a ship, for a boy of that kind would not let an opportunity pass, wherever he might be, to cheer her with tidings of his safety. Said a man thirty-five years president of a New England college: "I never knew a boy go far astray who devotedly cherished his mother and truly reverenced his father."

Now, fathers and mothers, if you want to improve your boys, and make them reverence you, keep your homesteads clean, and teach the children to cultivate a love for flowers. I think we have an instance in point in that wonderful people, the Japanese. There are no people on the earth who love flowers as they do; no people who cultivate them so universally. Every one must have flowers in his front yard—*must*, not by imperial edict, but by what is better, universal public sentiment. If, possibly, the local conditions in a narrow street do not permit a plat of flowers, they will then have potted flowers, and the arrangements in the rear for flowers are ample. Was it not a striking fact, at the Centennial Exhibition, that the only foreign bazaar adorned with native flowers and shrubs was the Japanese? and, however the commissioners mourned that they had suffered greatly by the long passage, they were exquisitely beautiful, as you well remember. My home has been fragrant, much of the time the last few years, with bouquets sent by Japanese students, which is their way of expressing gratitude for some little favor given. Then, again, the love of flowers is largely, in my mind, the secret of the wonderful politeness of the Japanese. No people on the face of this globe, in the family or in the school, so thoroughly teach the ethics and æsthetics of etiquette as do the Japanese. The French are also one of the politest peoples in the world, and the love of flowers is one of their characteristics.

I have been requested to say a word as to what trees to plant. Your printed programme specifies a list of trees. I would like to add one or two, while admitting the excellence of those named. I would add the linden, a magnificent tree and very hardy, and the common hemlock. Another noble tree which you have sought to grow is the tulip, and you have failed because you planted it too large. It has a deep root, and should be taken from the nursery young. It is a great mistake to think you are going to gain by planting big trees. If you plant them large, you must crop them, and a tree never recovers thoroughly from the beheading process. There will grow up, perhaps, two limbs and spread out, and then, in a tempest, the tree splits, and never develops its full beauty. I want to urge, also, as a very beautiful tree, which you will find growing across the river in Pennsylvania, at various points, the hickory and the black walnut. They both need to be planted young, and with care, the hickory especially. Let me drop a word of caution—not to plant big trees in little yards. While I advocate tree planting most thoroughly, I want to reiterate the old motto: "*Where the sunlight cannot come, the doctor must.*" Don't let the old Norway spruce stand so near as to shut out all sunlight. Your list of trees, recommended for the roadside, justly includes the elm, which unites the two elements of grace and grandeur more than any other tree. Michaux calls it "the most magnificent vegetable of the temperate zone." No doubt its roots extend further into the adjoining fields than those of any other tree. On this account the hickory, white ash, Norway maple, mountain ash, and especially the tulip, with its straight stem, that may be trimmed high, if need be, should be favorites with the farmers for the road-side. The tulip is a rapid grower, and attains large size, and is unsurpassed in the beauty of its form and foliage.

Of all exotics, I recommend the European larch. You can get it from Douglas & Sons, at Waukegan, Illinois, for $8 or $9 a thousand. It is very hardy, has a perfect root, and probably 990 out of every 1,000 will live. They come in perfect condition. The tree unites three characteristics—rapidity of growth, symmetry of form, and durability of the timber. We are planting it, in Massachusetts and Connecticut, for economical purposes, as well as for adornment. I find there is no need here of reclaiming barren lands, as in a town so fertile you have no sand banks. Further South, I should have dropped a hint about reclaiming sand barrens by planting the trees appropriate for that purpose. The larch is the great timber tree, as well as ornamental tree, at the present time in Europe.

But I notice that I have overrun my time, and, therefore, I stop abruptly; for I would not deprive you of the privilege and pleasure you have of learning the results of the sanitary survey of this place, made by so competent a gentleman as Col. Waring. May I congratulate you on your good fortune in securing such a survey. If any one has doubted the wisdom of it hitherto, I think ten years hence he will be thankful to this Association for this step. I have been surprised again and again, in going into our country towns, to find in the homes of men who thought they had everything in perfection, that the sanitary conditions were imperfect and bad; that the waste-pipe from the kitchen sink, for instance, emptied into a cesspool within six or eight feet of the well, and from it conduits formed in the course of years, so that the water was contaminated; and the most frightful diseases have, within my knowledge, come from drinking water rendered impure by the sink cesspools, which people think little of as injuring the health of the home. But I stop abruptly.

The President then introduced Col. George E. Waring, Jr., of Newport, R. I.

Address of Col. George E. Waring.

Mr. President, Ladies and Gentlemen:—I find myself laboring under a very unaccustomed embarrassment in appearing before you to-day. It is my misfortune to have been compelled to practice the gloomy profession of a Sanitary Engineer. I am seldom called to perform any service except where my labors are sorely needed. If I am sent for to visit a house, it is more than likely that the undertaker has been there before me. When I received the letter of your enthusiastic Mr. Fisk, inviting me to make a sanitary survey of West Ewing, my first thought was: "One more unfortunate!" I fully anticipated, judging from my previous experiences, finding matters so very serious here, and, perhaps, life grown so uncertain, that something would have to be done immediately, at least to maintain the price of your lands. I accordingly sent my assistant here to ferret out the sources of evil in all your houses, and I came yesterday myself to drive through your pestilential marshes, and to investigate your filthy drains. I find, quite to my surprise, that you have sent for the wrong man. It is no such place. In more than one respect this is fortunate, because the hour is getting late, and I shall say very little, for the reason that I have very little to say.

I have no doubt that in what Mr. Northrop has said, and in some things that I may say, there may be the suggestion of an inquiry concerning sanitary matters, which may lead you to desire further information on that subject. If so, I shall be glad to answer any inquiries you may make, and to enlighten you, if I can, on certain points. I beg you to disregard one requirement of the programme, which is that you shall put your questions in writing. I think it altogether unfair that you should be restricted in your method of inquiry, while I shall enjoy the more rapid one of answering your questions directly.

I say, frankly, after looking over so much of your town as is embraced in the province of your Association, that I have found only one serious source of trouble. A more beautiful and generally healthy looking section of country than this which surrounds your church here, I have rarely seen. There are certain bays at the side of the canal and some of the ditches running north and south between the canal and the river, that might be improved, although none of them are so serious as to require much professional advice. The saw-mill pond, on the other hand, is in every respect as bad as it could be. It would take too long for me to enter into a discussion regarding the causes of malaria, and what it is, at least according to our imperfect theories; but any one who has investigated the condition of malarious regions must see that there are, toward the upper end of that pond, conditions of soil such as may be surely depended upon to produce malaria, if they occur in a country where malaria exists at all. From what I see of the sources of supply of that pond, it is evident that when the mill is used the water must be drawn down very rapidly, and a considerable area of wet bank must be left exposed to the sun and air before the water again rises to its level. This is one of the most serious features of the problem. I state the case thus distinctly, because, fortunately, a short time before I came here, Dr. Lowrie took the pains to investigate the condition of the whole population within the immediate neighborhood of that pond. If I remember his figures correctly, he examined into the condition of the occupants of twenty-three houses, and found only two of those houses free from cases of chills and fever. While he does not know the total of population, he says he found fifty-eight cases of chills and fever. From the examination that my assistant has made of the rest of the territory, I should say there were, altogether, not ten cases in the whole remainder of the district. Now the correction of this difficulty is very simple, if means are provided for it; but it is absolutely essential, before that land can be drained and made wholesome, so that the poor people who live in the neighborhood may escape their chills and fever, that the dam should be taken down, the mill-right extinguished, and that land made as sound, in a sanitary sense, as that lying above or below it. I am informed that there are legal steps which may be taken, by virtue of recent action of the Legislature, by the Town Committee as a Board of Health, to remedy defects of this description; but that is, of course, the last resort among neighbors, who have associated themselves together, as you have, in friendly union; and it happens to be a case, if one can judge by the appearance of manufacturing establishments, where the entire value of the mill-right to its owner might be contributed by the members of the Association, or the inhabitants of the town, and thus the problem solved by other than extreme legal measures.

This, as I have said, is the only thing I have seen in the whole district covered by this Association, that is worthy of serious comment. We have examined between forty and fifty houses, and have found in no one of them gross defects such as we too often find in cities, and which are so marked in their unhealthy influence, and so much written about in the newspapers. But it is to be remembered that, if the defects of the country are not so gross as those of the city, they are sometimes more subtle. The sanitary rule has never been better formulated than it was by Hippocrates when he prescribed "Pure Air, Pure Water, and a Pure Soil." I think, if you look about your houses, even here, you will find that you do not, in all cases, live quite up to the requirements of this prescription. We have, all of us, more or less, inherited certain habits of life from our ancestors, who, if they lived healthily, did so rather through good luck than by good management, and who developed some habits which it would be well for their descendants to forget. They had also some advantages which the weather-strip man, and the carpenter, and the stove-maker have taken away from us. In the old houses, however impure the water and soil may have been, there was abundant opportunity, with the help of the open fire-places and the broad cracks, to obtain fresh air.

I find that in every house here, but no more than elsewhere, there is a disregard of the more simple requirements concerning pure air, pure water, and pure soil. For example, your householders are very largely chargeable with ignorance of, or indifferance to, the maxim that Mr. Northrop aptly quoted, "Where the sunlight cannot come, the doctor must." Your trees seem to me to be too large, too near to the houses, and too close together, and I sometimes wondered, as I was passing along, whether there does not run in your veins a strong infusion of the old New York Dutch blood, which leads to the closing of all your front shutters from Saturday until Saturday. *At all events, if the population are still in their own homes, they are certainly living with less direct, pure sunlight than they need and might have by a proper opening of their windows and shutters.*

The cellars of your houses we have found to be generally in good condition, but, from their construction, and from the character of their windows and the uses to which they are put, the idea seems to suggest itself that they are not in such good condition in Winter time. Your cellars are used, to a considerable extent, for storing vegetables, and I imagine that in the Winter time they are a good deal like farm-houses in other States, tightly closed, pretty musty, not always absolutely dry, and generally separated from the living rooms by only the board floor, with no plastering or ceiling underneath.

One habit prevails here, more, I will say, than in New England, and that is the making use of the back yard as a kitchen sink.

Now, if this is done consistently, and faithfully, and intelligently, it is a very good thing. If the house-maid will take pains, each time, to flirt her water on a new place, so as to let the old place dry, under the action of the sun and air, it is certainly as wholesome (though not as tidy) a way of getting rid of kitchen water as can be devised; but this care is very seldom taken, and in many places we have noticed that the water is cast on the same place, and that the land is foul, often very foul, and leading to the greater or less tainting of the well, according to its nearness. *I should say, that in so far as your circumstances are suspicious, you have decidedly to look to your wells. We have seen a good many that are more than suspicious. I would venture to say, without having made a chemical analysis of the water, or a microscopical examination of its contents, that it must, in many cases, be impure, unsafe, and only to be used with risk.* There is one house, for example, in this town, where the well is in the cellar, and where, outside of it, only thirty feet away, there is a vault, eight feet deep, full pretty nearly to the top, and located in soil which I believe would transmit impurities for a considerably greater distance than thirty feet. That is the most extreme case that we have found, although we have seen a good many others where the distance is far within the danger line. Now, it is quite true that you and your ancestors have lived (those who have lived) under these conditions, and have, nevertheless, had a lower death rate than many other places, not so favorably situated as regards soil and exposure.—

At this point the speaker was interrupted by the following question from one of his audience:

Q. Please define what passes beyond the danger line between the vault and the well?

To which the speaker replied:

That depends entirely upon the means of communication between them—whether the soil is composed of clay, of gravel, or of rock, with seams running from one to the other. It can only be determined by using some test, such, for instance, as to put salt water in the vault and to examine for salt in the well; but I should say that there certainly ought to be an interval of more than a hundred feet in such soil as this. It is natural for you to think that the idea that there is danger in such a case is all nonsense, and mere theory and "book-farming," for you have drunk water out of that well, and you know there isn't a better well in the State of New Jersey; your grandfather said there wasn't a better well anywhere round about. Now, such wells—wells held in just as high estimation—have, unfortunately, done great mischief in the world. One of the greatest outbreaks of cholera in London was traced entirely to the impurity of a public well. The *degree* of danger is very well illustrated by a remark made by Mr. Clark, Engineer of the Improve Sewerage of Boston, who said: "The risk is very slight, but it is a risk of a terrible danger." I have recently been reading the report of the Massachusetts Board of Health, which has just appeared, and in which there is an article on typhoid fever, by a physician of Massachusetts, where again and again there came, from the immediate tainting of a farm-house well, an outbreak of the fever, taking down nearly every person in the house, and resulting in one or two or three deaths in each case. The wells had been in as good condition as yours, but the moment came when they were in a state to receive and multiply the infection, and every man drinking the water fell more or less under the influence of the disease.

Our examination shows, in a few cases, that there are furnaces in the cellars of the houses for heating your rooms, which take their cold air from the cellar. It ought not to be necessary to go into any long argument to prove that a cellar, used as the cellar of any ordinary country-house is, for the storage of provisions, which has very little circulation of air, which is full of dust and impurities, which is more or less the home of rats and mice and cats and dogs, does not contain exactly the sort of atmosphere that you want to warm and bring into your living rooms for your children to breathe during the Winter. I think any one who has had the experience of such cases, or who has investigated the effect of furnace-heated houses upon the health of families, will agree that the fresh air should always be taken entirely from the outside of the house. It is better still, that it should not be taken from near the surface of the ground, the pipe being turned up a few feet to take in a purer air. We have found two, and I think three, cases where drains leading from the kitchen, emptied into the ground. In one case, where there were the ordinary plumbing arrangements, the waste of the whole house passed out through such a drain. We found such cases where the drains passed within a very few feet of the wells, being carried by vitrified pipe, with cemented joints, and supposed to be safe on that account. Now, if the vitrified pipe is sound, which it generally is, and has good joints, which it generally has not, it is safe enough. It has been a part of my work, for many years, to lay these pipes with cement joints, and I have come to the conclusion, that the one great difficulty in draining is, to make a *tight* joint where you are cementing two pipes together. I have almost given it up in despair. There were pipes taken up at Memphis the other day, which I had supposed were absolutely perfect, but my assistant informed me that there was a little stream of water running through in every case. It was very slight, but if it was passing along through the ground near a well, the constant dropping into the soil, not enough perhaps, to go into the well in a stream, but saturating the soil around it, so that when there is a heavy down-pour of rain it might be washed in, it would constitute a dangerous condition. The best remedy is, of course, to lay the pipe to some distance beyond the well, of iron with leaded joints; but where the drain already exists, it is a very easy matter to surround it entirely by a coating of cement concrete that will make it practically tight. Wherever a drain must pass near a well, I strongly advise that course of treatment.

I find another memorandum of a house where the vault is fifteen feet away from the well, is eight feet deep, and is not emptied until nearly full; the well itself being twenty-three feet deep. That case, I think, is very serious. In any community of farmers it would, perhaps, hardly do for a local committee, even if they were so disposed, to treat the hog-pen question as it is treated in cities. We all know that it is absolutely necessary to economical farming and country house-keeping to keep a pig, but it is really not absolutely necessary to keep pigs quite in the condition in which some few are kept in this town. I do not believe the pig is naturally a nasty animal. I don't think he is particularly fond of wallowing in dirty water.if he has any other way of cooling himself. I have seen swine kept in a different way, and I would modestly commend to the farmers and housekeepers of this town the suggestion that they learn how pigs may be kept in such a manner that their presence will not be noticed from the house or from the road.

Now, I believe I have stated the chief faults I have been able to find in an examination of nearly every house within this district; and, as you see, I have almost got a harvest of nothing, with the exception of the malarious condition about the millpond, due, I believe, entirely to the presence of that pond. With that exception, there is nothing here that is really a justification of my presence in West Ewing.

I shall now be very glad, if any members of my audience choose to ask questions on any sanitary subjects, to answer them to the best of my ability.

Mr. Edward Fisk.—I believe the Secretary has a letter from Prof. Schanck, of Princeton, stating a number of questions, which are quite comprehensive.

Col. Waring.—I will read the letter:

LENOX, MASS., Aug. 25th, 1880.

MY DEAR SIR:—I have not forgotten your request, and only regret that I cannot be present and contribute questions suggested by the occasion and circumstances. I should seek information upon arrangement of grounds, shrubbery, fences, &c., and upon water-closet sewerage and cesspool, &c. Thus:

1. What mixture of grass seed is best for lawns?
2. How often should they be mown?
3. Are door-yard fences needful in a village?
4. Which is the best village hedge material—Arbor Vitæ, Hemlock, &c?
5. For a village without public sewers, which is to be preferred, outside privies, or inside earth closets or water closets?
6. If the latter, how can the efflux be safely disposed of?
7. If a cesspool is uncemented, will it not in time poison the wells?
8. If cemented, will it not fill every few weeks or months, and be a constant nuisance?
9. How should it be trapped and ventilated?

10. What should be done with kitchen slops?

11. Is the Lenox sewerage system applicable to single country houses?

12. In this case, what length of two-inch distributing pipe suffices for each person?

13. May this not freeze up in Winter so as to check distribution?

14. Typhoid fever and kindred diseases are often clearly referable to human excrement, especially when moist and damp. Is the poison introduced through water by stomach, or through air by lungs?

15. What disinfectant is the best for ordinary family use?

16. Relative merits in this respect of air and light, of chlorine, of carbolic acid and of sulphate of iron, also of dry clay.

These are hints and suggestions only, from which you can frame questions and call out information.

Yours very truly,

J. S. SCHANCK.

Col. Waring (quoting from letter.)—"What mixture of grass seed is best for lawns?" [See Notes.]

I would respectfully call on my associate.

Mr. Northrop.—You are familiar with it.

Col. Waring.—Not as familiar as you are. We use Rhode Island bent grass and white clover, introducing a little blue grass seed. I think our best lawns have much white clover.

(Reading again from Prof. Schanck's letter.)—"How often should they be mown?"

My answer to that would be, as often as possible.

(Reading again)—"Are door-yard fences needful in a village?"

Mr. Northrop.—No.

Col. Waring.—Are they *desirable?*

Mr. Northrop.—If you can bring the community to agree, I think they are undesirable. Nothing is more beautiful in a large village, than the absence of fences, and in a farming community like this, where you have the matter entirely under control, it seems to me to promote a sentiment of sociality to have the fences taken away. At Williamstown, Mass., and that model manufacturing village, Cheneyville, at South Manchester, Conn., and the St. Johnsbury factory, in Vermont, and in places where the grounds are thrown together, it adds very much to the general satisfaction.

Col. Waring.—Which is the best village hedge material?

Mr. Northrop.—That depends altogether upon the climate. You cannot give any general direction. There are some places where the osage orange will not grow. It grows here, and very beautifully, if properly cut. [See Notes.]

Col. Waring (reading from the letter.)—"For a village without public sewers, which is to be preferred, outside or inside earth closets, or water closets?"

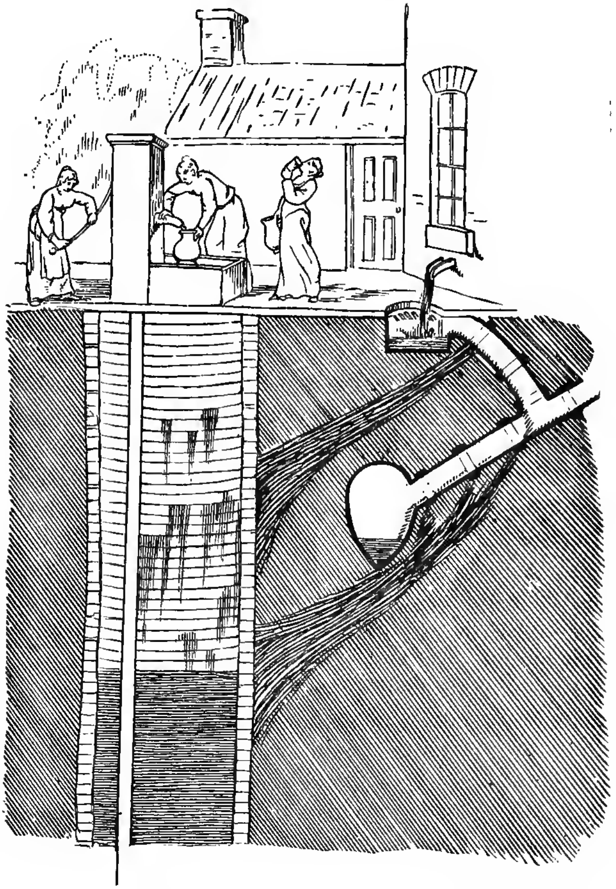
I should say, where there is land enough about the house to dispose of liquid waste, and where there is water that can be pumped to a supply cistern in the house, that a water closet is much more cleanly and certain of being in good order without extra care, and, therefore, to be preferred. The earth closet is a possible remedy for all evils; but an in-door closet requires, on the part of every person using it, the most constant watchfulness and care, or it becomes offensive. I had to do with the introduction of that improvement in this country, and was its strongest advocate for a very long time. I have no other conveniences in my own house, but I have come slowly to the belief that it is, after all, but a stepping-stone between the old-fashioned arrangement and the well-constructed and well-arranged water closet.

Question by one of the audience:

Dr. Lowrie.—What is the least distance from the house that kitchen and other drainage may properly be disposed of?

Col. Waring.—I will read Prof. Schanck's question on the same subject, in conjunction with this: "How can the efflux be safely disposed of?"

If these matters are to be disposed of by discharging them into cesspools, I should want to put the cesspool to the farthest possible distance—the back field of the farm rather than nearer, for the reason that however well made, and however tightly secured against escape into drinking-water wells, it is really a vast retort filled with foul matter and dangerous gases, which too often find no other means of escape than through the drain to the house. I believe it would be really much better, as a question of health, if the drainage from the house was delivered directly upon the surface of the ground within twenty feet of its back door, bad as this would be, than to have a cesspool at that point. It would not look so well, but I think it would be less dangerous. Fortunately, it is not necessary that either one of these evils should be chosen. A system applicable to every-



PURE(?) WELL WATER, DEFILED BY DRAINAGE FROM THE KITCHEN SINK AND THE CESSPOOL.
(From "The Sanitary Engineer.")

thing of a liquid character, growing out of an invention made by the inventor of an earth closet in 1868, and since developed by a long experience in England and this country, seems to offer everything that one may desire, if there is a little land around the house. Dr. Lowrie asks within what distance the disposal may take place. I say, always get as far away as you conveniently can. All the liquid waste of my own house is disposed of on a tract of land the first edge of which is about fifteen feet from my piazza, where we spend the Summer. If I had more land, I should go farther away; but with no more land at my disposal I should not hesitate to repeat the same experiment. This system is in use now in a large number of houses in New England and New Jersey, particularly in Orange and in the village of Lenox, from which Prof. Schanck writes, and still more extensively at the Women's prison, at Sherborn, Mass., where there is a very large consumption of water. Its principle is this: That if foul matters are absorbed by the surface soil within reach of the roots of vegetation, and within reach of the atmosphere, the oxygen of which exists in that soil in a state of condensation, they will be acted upon immediately, and will be in a short time completely destroyed; so that if the interval of a day be left between one wetting and another, the action of the roots and of the air will keep the soil always perfectly clean. Suppose we have a drain running down the length of this aisle, made of ordinary drain tiles, and loosely laid at the joints. You attempt to run fifty gallons of sewage through that, and, if the soil is at all porous, and there is a slight leak at every joint, by the time it gets to the other end it has nearly or quite all settled into the ground. Its tendency is to follow the laws of gravitation and descend in the ground, the soil acting as a filter and holding all the impurities behind. Immediately there comes the fresh air, which changes its character or entirely destroys it and consumes the foul matters left there. Now, if it is a question of draining a single house, you have your pipe (we will say a length of twenty-five to fifty feet, according to the character of the soil and slope of the ground,) for each member of the household. It may be one line, or a number of lines branching out from each other, according to the character of the soil. The liquid is delivered into a Field's Flush Tank. When that becomes full, it discharges its whole contents rapidly into the drain. Your tank is arranged to become full once in about two days, so that in every two days there is a rush of water through the drain; its foul waters sink into the soil well filtered, and, by reason of the cleansing action of the air and the roots, the soil is made ready to receive the next accession. In the case of a village, the tank, instead of holding enough for a family for a couple of days, should hold enough for a village a couple of days. In Lenox, the tank holds three thousand gallons, about, and the pipes that receive its discharge are about ten thousand feet in aggregate length. At the prison, the tanks discharge fifteen thousand gallons at a time, and they discharge alternately into two sets of drains of ten thousand feet each; but always working on the same principle, as if you put the water of a single house into a single straight pipe, from which it leaks out into the ground of a door-yard.

Now, as to the result, I can only say that I have never heard of any suspicion of an odor from the surface of the ground under which this operation is taking place. I have never heard of a case of sickness being ascribed to it. I have dug down close to the joints of my own drains, within half an inch of a wide opening which evidently had been receiving copious discharges, and it was impossible to tell, by smell or sight, any difference between that earth and earth taken ten feet away. At the prison, in Massachusetts, our disposal is into artificial draining ground. The whole tract is drained five feet under ground with drains twenty feet apart. The water that is discharged there from the purification of this very foul, black sewage is simply pure water, which I would compare with the well water of any farm-house; at any rate, any village well water, where villages are conducted as they ordinarily are. By chemical analysis it is shown to have a little more organic matter than it ought to have, but it is in such a condition that it is impossible to detect it by anything except a chemical analysis. It is perfectly sweet and clear.

Question.—What you stated as the greatest evil in this town, in a sanitary point of view, was the existence of this mill-dam. I would like to inquire, first, whether the conditions of mill-dams generally are such as to generate this miasma or malaria; and, secondly, whether there is anything special, and what it is, in the condition of this mill-dam which generates disease? You observed that, as a matter of course, it would produce these malarious effects.

Col. Waring.—There is no disadvantage in having a mill-dam, as a mill-dam, if it is simply a reservoir of pure, deep water. If it has steep sides, a change up and down in its elevation can do very little harm; but if, as in this case, the banks are in many places very sloping, and the land is saturated with water for a considerable distance back from its edges, and if, when it is drawn down, a great width of saturated earth is exposed to the sun, or if in parts it is so shallow that the sun's heat will have an effect on the bottom, then the existing conditions are considered to be dangerous, and I have never known them to exist in a country where malaria had a foothold at all, without causing or increasing it.

Question.—If there are, then, pools of standing water which become dried up by drouth, there are similar tendencies?

Col. Waring.—During the time it is passing from the wet to the dry condition. After the ground is dried to a considerable depth, I do not suppose that harm continues; but one of the greatest factors in the generation of malaria is the alternate wetting and drying of land that is subject to malarial poison. Prof. Schanck asks:

"If a cesspool is uncemented, will it not in time poison wells?"

It certainly will, in the cases of wells near enough to it to receive its contents unpurified.

"If cemented, will it not in a few months become a nuisance?"

Yes, if the cement is tight. I imagine that many cesspools get rid of a large quantity of foul water through the imperfection of their work.

"How should it be trapped and ventilated?"

I think, if you have a cesspool, it had better be ventilated as little as possible. If you have a great seething mass, and give it ventilation anywhere within the reach of grounds where you live, there will be great offence from it. I have tried several times to ventilate a cesspool, but I have been compelled to shut it off again. I should rather run drain pipes off through the ground, so that if there were any pressure of air it would work up through the soil, purified in its passage.

Question.—Would you ventilate a cesspool by a chimney?

Col. Waring.—No. Most of the time, if you have a strong upward draft, it is all right; but I never knew a house with such an arrangement that did not at some time have an offensive smell. I believe in ventilating the soil pipe most thoroughly, but not in making it a vent for a foul cesspool. I always run a soil pipe through the roof of the house, and am very careful to place it much lower than any chimney near it.

Question.—In case you had no ventilation to the cesspool, what would you depend upon to prevent the circulation of air to the house?

Col. Waring.—I would have a strong trap in the drain leading to the cesspool; then have air pipes leading from the cesspool out into the soil, so that pressure would be relieved that way.

Question.—What do you think of running a ventilator directly into a chimney that is constantly used for a fire—a kitchen chimney?

Col. Waring.—I do not like it. The fire is not constantly burning. It is not burning at night, and I don't think it is trustworthy. Of course it is better than running into any other chimney.

Question.—What do you think would be the result from that —that the gas might go through from the chimney to the house?

Col. Waring.—I have frequently gone through houses ventilated in that way, which had been unoccupied for two or three days, and the stench from the cesspool was all through the house. Then, frequently, I have found an odor in an upper room through which the chimney passed, which I could trace from no other source than the movement of air through the brick work.

Question.—Suppose you run the ventilator right out across the roof to the chimney?

Col. Waring.—Then you would have danger from the down draft when your kitchen is cold.

Question.—The trap in the closet would not prevent that draft coming in the house?

Col. Waring.—You are ventilating outside of your trap.

Question.—That is what I said. You said it would be a down draft into the house. How could it be?

Col. Waring.—It would be a down draft through the chimney and out through the stove or fire-place.

Question.—What is the width of the lot where you distribute the waste from the house?

Col. Waring.—The main drain is about sixty feet long, and there are nine drains about eighteen or twenty feet each. I have had it in use just ten years. It was put in ten years ago in November.

Question.—Your pipes average about fourteen inches from the surface?

Col. Waring.—Not more than ten or eleven.

Question.—Suppose you have a level surface to distribute it over, where there is scarcely any fall?

Col. Waring.—You need scarcely any. Two inches in a hundred feet is enough, and you can always get that. Within the range at which you can place these pipes, you can always get the fall you need—even if you have to put the pipes a little higher at one end than at the other.

Question.—Can it be worked without a flush tank?

Col. Waring.—It *can* be; but the trouble is, you always keep the ground about the upper end of the pipes saturated, and you have to depend upon the rank vegetation that grows from that excessive moisture.

Question.—You say you have had these drains in use ten years and have not discovered any unpleasant odor arising from the surface?

Col. Waring.—Yes.

Question.—Would that probably be the case ten years hence?

Col. Waring.—I don't think there is the least change in the character of that ground. I think it is exactly the same as it was before I began to use it. I think the oxidization has destroyed all the matter. It may have become a little deeper in color, but, practically, I think it is the same. And the action of this material is so very slight in its reach that while my drains are six feet apart, fully four feet of the space between them shows no effect of the sewerage at all.

Question.—What effect has the frost?

Col. Waring.—I think it has no effect at all. I have had the ground frozen three and one-half feet down, and there was no trouble in my pipes. They have never had any trouble in Lenox. One great point about it is that it is so cheap and simple, and so entirely within the hands of any one who wishes to use it. If these poor cottagers down by the canal had these pipes, all they would need would be some place to throw in a bucket of dirty water and that would be their flush tank. [See Col. Waring's Report, on page 42, for further details.]

Col. Waring (reading from letter)—"What disinfectant is the best for ordinary family use?"

Fresh air.

The hour had become too late to discuss all the questions of Prof. Schanck's letter, and, on motion, the meeting was here declared adjourned.

THE
WEST EWING IMPROVEMENT ASSOCIATION.

REPORT ON THE SANITARY CONDITION OF THE WESTERN PART OF EWING TOWNSHIP.

BY COL. GEORGE E. WARING, JR., NEWPORT, R. I.

The examination upon which this report is based, includes an investigation into the character and condition of between forty and fifty dwelling-houses, including the disposal of household wastes and the water supply. No good purpose would be served by detailing in a public report the enumeration of defects of private property. Sufficient notes have been taken concerning each place, and notification is given to the respective owners that on their application, any information which may be desired beyond that of a general character not included in this report, will be cheerfully furnished free of charge.

As a whole, the houses average certainly better than is usual in an agricultural and quarrying district. There is no one of them which might not be very considerably improved by a sufficient expenditure. But I am satisfied that in so far as they or any of them are in a less healthful condition than similar houses in other parts of the country, their defects are chiefly due to two causes:

(1) An improper disposal of liquid and solid household filth including fæcal matter with its attendant fouling of the air, and its contamination of the water supply, and in some cases of the cellars of the houses. In some instances the same difficulty results from the accumulation of the manure of domestic animals in too close proximity to wells or dwellings.

(2) A malarious condition of the site in certain parts of the town, caused by stagnant bays at the side of the canal; by standing water in the quarries; and especially by the damming back of the natural drainage by the dam at Keeler's saw-mill; this latter being far more important, in my judgment, than all other defects combined.

It is not worth while, in making recommendations for the practical improvement of country-houses like those under consideration, to advise the introduction of modern improvements in the way of water supply and drainage, which it would be in some cases beyond the means, and in nearly all cases beyond the inclinations, of the proprietors to adopt. It seems better to confine ourselves to a few simple, practical improvements within easy reach of all, which will constitute in every case a simple and radical improvement over the present conditions, and which will be as much in the way, at present, as it can reasonably be hoped to secure.

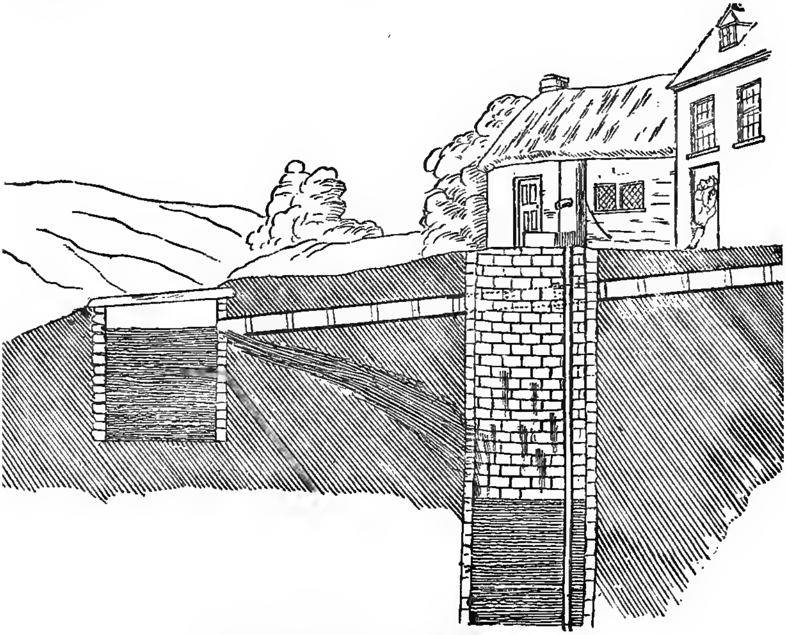
The improvement of the ventilation, cleanliness, and, where necessary, of the draining of

CELLARS,

Is certainly very important, and it needs no instruction from me to teach all householders what they already perfectly well understand. It must be evident to all that a wet, close, musty cellar, with no access for fresh air during the Winter time, with accumulations of decaying vegetables and rubbish, is not a good accompaniment of any inhabited house. It is by no means necessary that cellars should be so open to cold winds as to lead to the discomfort of those who live in the rooms above them. But there should certainly be, at all times of the year, a sufficient opportunity for the supply of fresh air to create a sufficient circulation to remove dampness and to carry away the products of the slight inevitable decomposition of what it is necessary to keep in them. A few of the houses within the district are heated by

FURNACES.

These, I believe, with hardly an exception, take their air supply from the cellar. No matter how well ventilated and how clean a cellar may be, its atmosphere is never fit to be heated by the furnace and distributed through the house. It is a very simple, and most important, matter to connect the air supply of the furnace with the outer air by means of a tight wooden box which shall exclude the atmosphere of the cellar from the heated flues.



A CESSPOOL LEACHING INTO A WELL.
(From "The Sanitary Engineer" of July 15, 1879.)

What is not so well understood, or, if understood, is not acted upon, is the absolute importance of

SUNLIGHT AND FRESH AIR.

Let the sun have free access to the outside of the whole house at some time during the day, and keep shutters and blinds and windows open except when it is necessary to exclude it. Never mind faded carpets; they are not so bad as faded cheeks, and these cannot be avoided except by fresh air and ample daylight.

THE DISPOSAL OF HOUSEHOLD WASTES

Is hardly less simple, but it is much less generally understood; and I believe it is safe to say that in nearly every instance where my examinations have been made, the system now adopted is particularly bad. There are very few cases where the well water is not subject to dangerous contamination by the leachings from privy vaults or cesspools or hog-pens or barn-yards, or by the settling into the ground of the drainage from the kitchen sink.

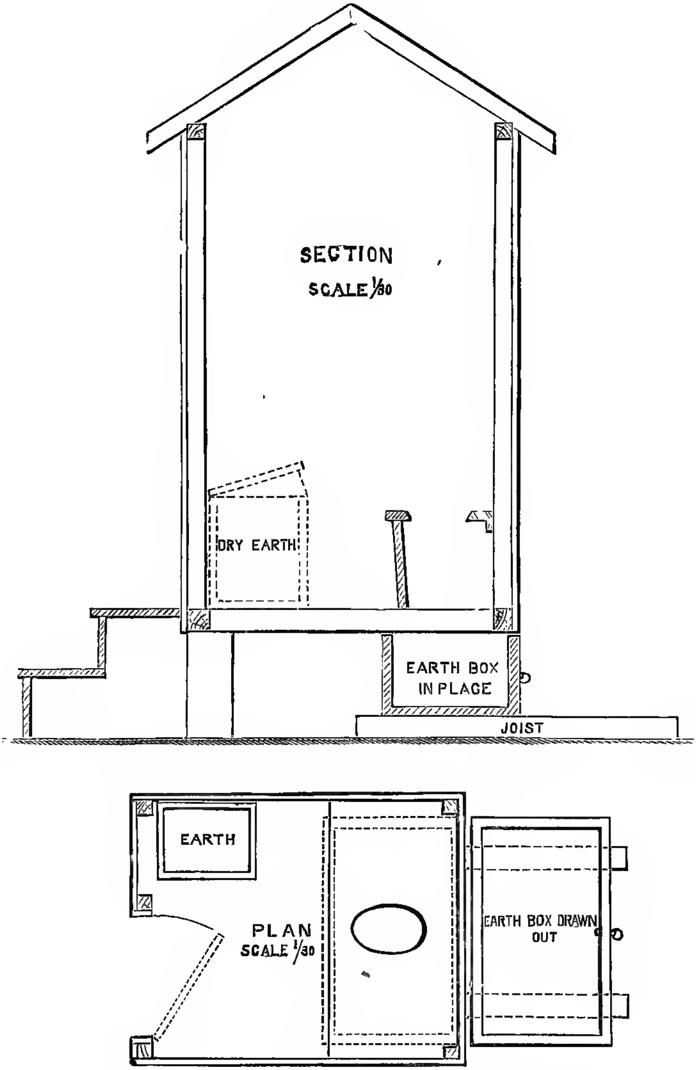
It will be easy, in the matter of hog-pens and barn-yards, to prevent the leachings of their manure from draining toward the well, or from sinking into the ground near the well; and this certainly should be secured, even at the expense of selecting a new site for such deposits, and, so far as possible, by protecting manure from drenching rains. Such protection will be amply repaid by the saving of fertilizing matter which it will secure.

The specific recommendation that I make is, that in every case, whether it be a well-appointed farm-house or simply a laborer's tenement, some means be adopted which will secure an entire abandonment of privy vaults, and a safe disposal of liquid household wasts. These are two distinct items of the work, which may be carried out more or less elaborately according to the means and inclinations of the proprietor. I propose to recommend, in this case, only the simplest and cheapest available methods.

THE PRIVY

Should be removed from its foundation, its vault should be entirely cleaned out, its foundation walls should be removed and the excavation should be continued until clean earth is exposed at every point. It should then be filled to the surface of the ground with clean earth, and, if it is necessary to use the same site in future, this should be so rammed in the filling as to prevent future settling. It will be better, in all cases, to remove the building at least far enough to secure a sound foundation. The building should then be set on posts or piers so that the lower side of its sill shall be at least eighteen inches above the surface of the ground; suitable steps being constructed for its approach. Lay on the ground, with cross-stays to hold

EARTH-CLOSET PRIVY.



Geo. E. Waring, Jr.

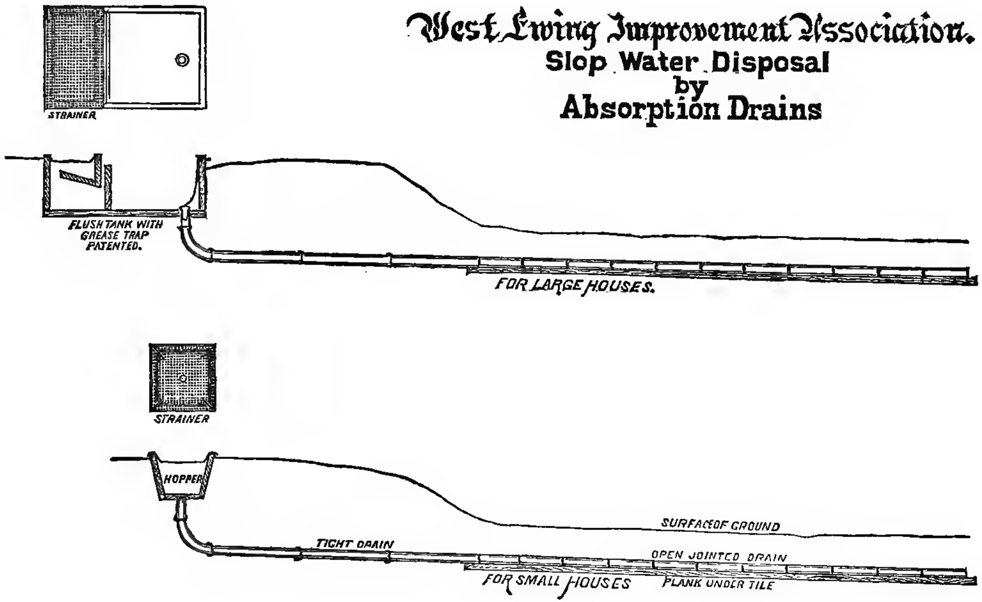
them in position, two joists extending at least from the front of the seat to two feet outside of the building, at the rear.

Make a box of stout planks to rest upon these joists, large enough to reach well under the seat and high enough barely to pass the sill easily. Secure a stout handle to this box by which it may be drawn out over the joists outside when necessary for emptying. The inside of the box should be well rendered with hot coal tar quite to the top. This is the receptacle for fæcal matter. Its bottom should be covered at least to the depth of one inch with dry earth or ashes. In the house there should be a second box containing dry earth or screened ashes, and a hand scoop should be furnished with which to throw it into the box below. After each use of the privy, rather more than a pint of this material should be thrown down to cover the dejections and and to absorb the urine. From time to time it will be necessary to rake down or level off the accumulations, and when the box becomes full it should be drawn out and emptied, its contents being used as manure. This constitutes the cheapest form of earth closet; and it secures, if care is given to the uniform covering of the deposits, a perfect suppression of odor, and entire prevention of injurious decomposition, and a perfectly healthy and satisfactory condition. The value of the manure will be quite sufficient to compensate for the slight additional trouble; and the avoiding of the horrible stench of the usual country privy will secure the great difference between a brutal filthiness and civilized decency. Those who desire something more elaborate and more convenient in its operation, may address "Earth Closet Company, Hartford, Conn.," for the mechanical apparatus by which the deposit of earth is made automatic.

THE DISPOSAL OF KITCHEN SINK WASTE,

Chamber slops and laundry water, is a question which has engaged the study and ingenuity of the world for many years. I believe that, so far as isolated country-houses are concerned, it has been perfectly accomplished by the system known as "sub-surface irrigation." This system is susceptible of much elaboration, and may be carried out in an expensive manner; but its essential results may be secured with an expense so trifling that not even in the smallest tenement-house need its cost be an obstacle to

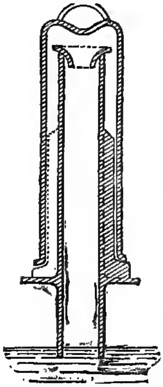
West Ewing Improvement Association.
Slop Water Disposal
by
Absorption Drains



its adoption. It is based on the fact that the surface soil which is within the reach of the roots of grass or other plants, and of the action of the atmosphere, is a very active destroyer of organic matter. A cotton rag buried a few inches under the surface is very soon entirely consumed by this action; and all decomposable matter so placed is destroyed by oxidation or slow combustion as completely, though less rapidly, as when it is thrown into the fire. In order to make this process continuous, it is necessary that there should be free access of air into the pores of the soil. In the case of liquid wastes, it is necessary that the discharge be intermittent, for when a constant small stream runs into the ground, saturating a small area, the entrance of the air is prevented and the oxidizing action is retarded. With even a few hours' interval between the two discharges, the water settles away into the ground, which acts as a filter, holding back all of its impurities, and its descent is followed by the entrance of fresh air, which immediately attacks and destroys the retained organic matter. If the liquid is thrown on the top of the ground, it produces in a short time a fuddled condition of the surface which prevents the free entrance of air. It is, therefore, desirable to introduce it into the soil below the surface, allowing it to soak away in so gradual a manner that no fuddling of the earth can take place. This introduction into the earth is by the use of common agricultural drain tiles with open joints, laid not more than ten inches below the surface. The intermittent action is secured by delivering liquid wastes into these tiles, not constantly, but from time to time.

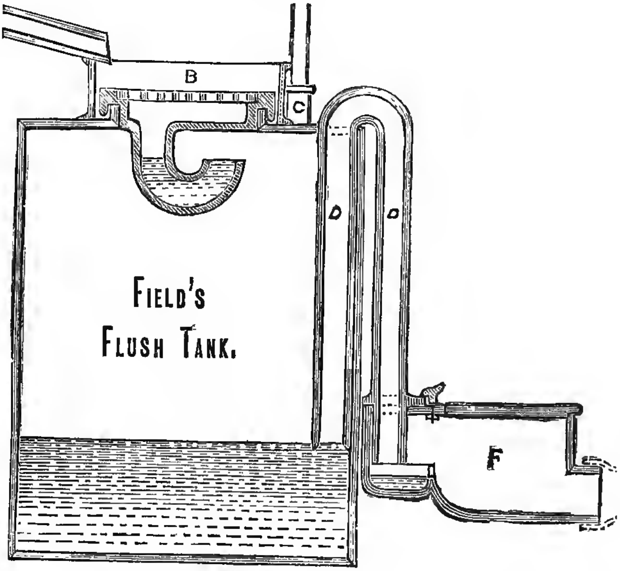
In the case of a small tenement-house, where only two or three pailfuls of waste liquid are produced in the course of the day, this absorption drain need not be more than forty feet long. It may be one continuous line of pipe, or it may be several shorter pipes branching from one main line, according to the space devoted to the use. It may lie under the grass near a row of currant bushes, under a grape-vine trellis, under a grass plat, or elsewhere. Opening into it, there should be a box [See cut on page 48] large enough to hold a pailful of water; and the joints of this box, as well as the space around the pipe leading from it, should be made tight. It may be covered in Winter, as a protection against frost; but in Summer it will be better that it should have a full exposure to the air. A wire cloth or other screen should be provided at its top to act as a strainer to hold back coarse matters which might obstruct the pipe. From time to time, this strainer, which should be movable, can be emptied into the swill barrel, or its contents may be thrown upon the manure heap, or buried in the ground. The liquid which passes the strainer will enter the pipe, leach out into the ground and be purified. The arrangement described will be quite sufficient to receive the contents of one or two wash tubs; but it should not be connected with the kitchen sink delivering only a small flow. Whatever is thrown into it should go with a rush, so as to reach as far as possible through the whole length of the drains.

For houses of larger size, producing a greater amount of waste, the length of drain should be from one hundred and fifty to three hundred feet, including all branches, according to the size of the family and the freedom with which water is used. A uniform distribution through this length of pipe cannot be secured by throwing into it a pailful at a time. Some arrangement should be adopted which will retain water to the amount of a barrelful or more, and which will, when the tank becomes full, deliver the whole contents suddenly. The apparatus best adapted for this use is known as "Field's Flush Tank," which is made of cast iron, and which is sold for about thirty dollars, by A. G. Myers, 94 Beekman street, New York. A much cheaper arrangement can be made at home, which, while not having the advantage of the Field automatic siphon, will secure the same result, if attention is given to opening and closing its outlet by hand. The construction of this tank is shown on page 48. It is made of plank, and is separated by a grease-catcher, which will prevent congealed grease, floating substances and heavy matters from passing into the discharging chamber. It also has a spatter-board, to prevent the disturbance of the sediment, and a screen to hold back coarse matters. It is, in fact, a flushing tank with a grease-trap intervening between it and the source of supply. This interposition of a grease-trap



FIELD'S PATENT ANNULAR SIPHON.

is covered by a patent of my own; but permission is hereby given to any member of the West Ewing Improvement Association to use it, without charge. The size of tank indicated in the sketch is sufficient for three hundred feet of drain. The capacity of its second or discharging chamber may be proportionately reduced or increased as the length of drain is made greater or less. The grease-trap may be attached to any waste-pipe from the house, or it may be filled by pouring into it the contents of chamber pails, wash tubs, slop pails, &c. The grease-trap serves to hold back all obstructing matters. The outlet of the discharging chamber is closed by a plug of wood,



Description of Field's Flush Tank.—It is intended to be placed immediately outside of the walls of the house, and to receive all of its liquid wastes. It is made entirely of earthenware or of cast iron. The liquids pass through the grating of the pan (B), and are discharged through a trap which prevents the contained air of the tank from escaping. (C) is a socket for a ventilating pipe to carry this contained air to the top of the house. The tank holds about 20 or 30 gallons. This has no outlet save through the siphon (D). The outer end of the siphon enters a discharging trough (F), which is made to turn to the right or left, so that its mouth may be directed as required to connect the tank with the line of outlet pipes. This trough is of a peculiar shape which assists small quantities of liquid in bringing the siphon into action, or by an india rubber ball; the stopper being attached to a chain, by which it may be lifted whenever the discharging chamber becomes full. After the chamber has discharged itself, this outlet should be tightly closed. To make this arrangement automatic in its working, it is only necessary to substitute for the plug, the Field's Patent Siphon shown on page 50.

A little judgment will be necessary in adjusting this apparatus to the lay of the land. If the absorption ground is to be placed at some distance from the house—and it should never be nearer than fifteen feet to any well from which drinking water is taken —it may be connected with the flush tank by a vitrified pipe with very securely-cemented joints. These joints should first be packed with oakum, or with rags, to prevent cement from running to the inside of the pipe and making rough points to arrest foreign substances passing through to them, and they should be covered with a good band of the very best hydraulic cement—the joints not being covered with earth until it is quite certain that they are absolutely tight. This precaution is especially necessary in passing near a well. The absorption tiles should be two inches in diameter, and only one foot long, in order that the joints may be frequent. Their form is not of much importance, but the best material for the use is the round pipes with gutter tiles to lay them in, and caps to

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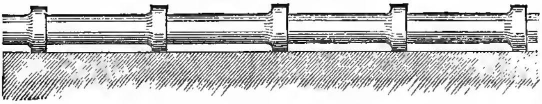
instead of merely dribbling over the siphon without charging it as they otherwise would do, and has a cover which can be removed to give access for cleaning.

When the tank is entirely filled, the pouring in of a few extra quarts of water, which is sure to occur at some time during the day, brings the siphon into action, and it flows copiously until the tank is emptied to the depth below which solid matters are permitted to accumulate, to be occasionally cleared out on removing the pan (B).

As the sink pipe discharges over the grating of the trapped inlet (B) outside the house, the connection between the drains and the house is completely broken, and any entry of foul air from the drain is rendered impossible. The top of the tank is perfectly closed by means of the water joint around the cover, and the cover is readily removed when required. The inlet, moreover, forms a basin, which may be used for throwing down slops outside the house.

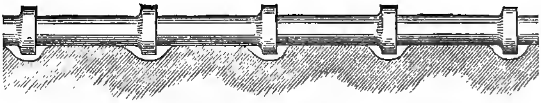
When used for the *disposal of house slops where no regular system of sewerage exists*, the flush tank enables all house refuse to be removed inoffensively—the bed-room slops being thrown down the basin at the top of the tank outside the house—and thus where earth or other dry closets are used for the excreta, this apparatus supplies a complete sanitary system of drainage. The concentration of the flow of the sewage effected by the sudden discharge of the tanks, forces the liquid rapidly along the pipes, and prevents their being choked. The liquid can thus be distributed over a sufficient area of ground to give full opportunity for the soil to purify it. The tanks are ordinarily made to contain 20 or 30 gallons in addition to space for deposit.

keep the dirt from entering the joints from above, manufactured by C. W. Boynton, Woodbridge, N. J. The joints must not be too tight. If the gutters are not used, the tiles should be laid on strips of board, for it is now and then necessary to remove some portion of the drain to clear out accumulations, and either the gutters or the strips are desirable to secure their being relaid on the proper grade. The grade or pitch of these drains should not be too rapid, lest the water flow too much to the far end and force its way up to the surface of the ground. It has been found in practice that four inches fall, or, at the utmost, six inches fall in one hundred feet, is better than anything steeper. If the land slopes more than this, the tiles should be laid obliquely across the slope. If the yard or garden where the disposal is to be made is on the same level with the house, the tank will have to be built considerably out of ground. If the ground about the house is higher than that used for disposal, it may be built entirely in the ground. In this latter case, the cemented pipe will be enough below the surface to prevent its disturbance by frost. If these joints must be within eighteen inches or less of the surface of the ground, the course of the tight part of the drain should be covered with litter during the Winter season; and in this case, as well as in that of the one referred to above, the tank itself should be protected against



PIPES RESTING ON THEIR SHOULDERS.

THE IMPROPER WAY TO LAY THE VITRIFIED PIPE.

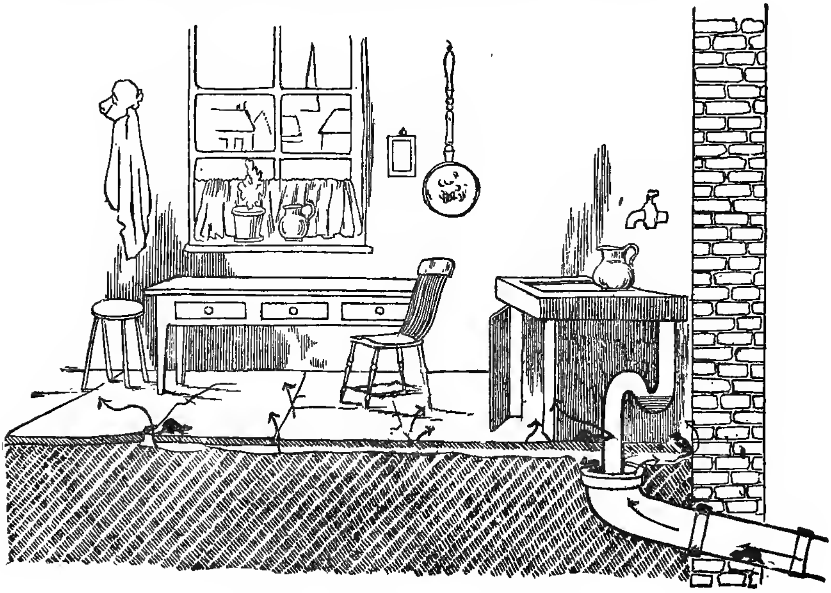


PIPES RESTING ON THEIR FULL LENGTH.

THE PROPER WAY TO LAY THE VITRIFIED PIPE.

frost. Its contents will be so warm that a little covering will be sufficient.

I repeat that I am disposed to confine my general recommendations to these two general improvements. If their general adoption can be secured, the Association will have accomplished a result which cannot fail to have the most advantageous influence upon the health of the community, and, I am disposed to say, upon the self-respect and comfort of its members.



RATS AND THE TALE THEY TELL.
(From "The Sanitary Engineer" of July 15, 1879.)

THE BAYS AT THE SIDE OF THE CANAL

Or feeder are in many places too shallow. Wherever malaria has gained a foot-hold, as it certainly has in this vicinity, shallow, stagnant water should be avoided. Every pond or bay should be deep enough to be sufficiently beyond the influence of the sun's heat to prevent vegetation at the bottom. The banks of these bays and of all ponds should be steep, and they should be grassed to the waters edge. If there is any material variation in the level of water in the canal, by which its edges are made alternately wet and dry, this condition must be overcome, or the people must accept the fact that they live in the presence of a source of malaria which they cannot remove. It may be a great source of malaria or it may be slight. It certainly is incomparably less than the difficulty caused by

KEELER'S MILL-DAM.

This dam I consider by far the most serious factor, so far as malaria is concerned, with which we have to deal. Its bad influence is felt all the way from the mill up to the rear of the River Bend estate, and as much farther as the wind is capable of bearing the malarial influence.

The whole question of malaria is imperfectly understood, and we can reason about it only from ascertained general principles; but some of these are so well demonstrated that no sanitarian would presume to disregard them. Two different conditions are acknowledged to be of the very worst character. They are:

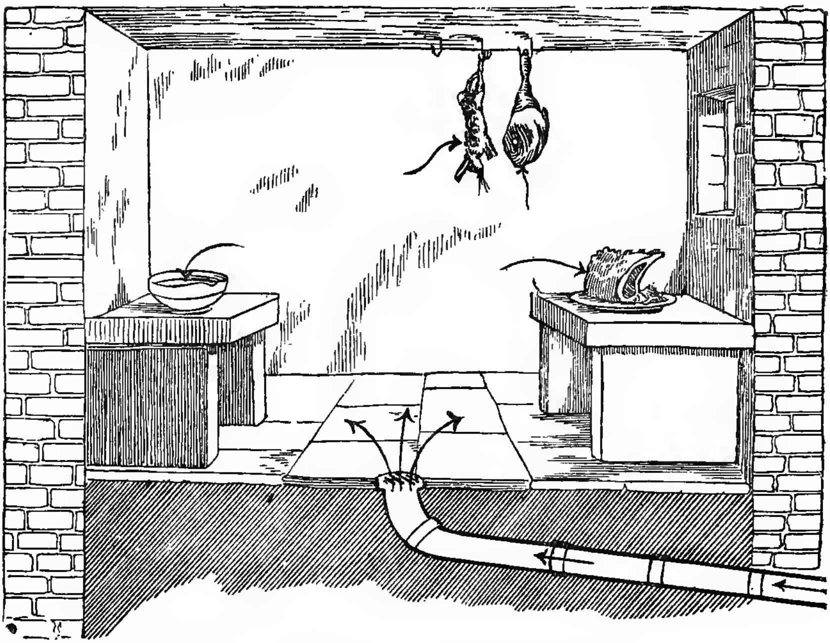
(1) The complete saturation of the ground within a short distance of the surface, that surface being exposed to the action of the sun.

(2) The raising and lowering of the levels of bodies of water so that their shores are alternately wet and dry.

Both of these conditions are secured in the most complete manner in the case in question. Much of the land bordering the brook and its enlargements, which constitute Keeler's millpond, and which extend for nearly a mile along the west side of the canal, is so low as to be completely saturated by the water of that brook. The supplies of this stream are so insignificant in amount that they can count as very little against the draft upon the pond when the mill is in operation. The water is drawn off much more rapidly than it flows in, and it exposes wide stretches of bank to the action of the sun.

No doubt some difficulty comes from the stagnation of water in the quarries, and still more, perhaps, from the leaking of the canal. It is possible, too, that the draining between Keeler's pond and the water-power is less effective than it should be. But all these may be overcome if the dam is removed; and all combined are insignificant as compared with the pond, which, in my opinion, constitutes a nuisance of such magnitude that the community cannot safely permit it to continue.

That there results from the sources that I have indicated, a very serious malarial condition which is producing a disastrous effect upon the people who live in this vicinity, is fully demonstrated by an investigation recently made by Rev. Dr. Lowrie.



MILK AND PROVISION ROOM WITH UNTRAPPED SINK.
(From "The Sanitary Engineer.")

This investigation relates to twenty-three families, being all the households beginning with his own and proceeding up the Greensburg road, and at the quarries immediately about the Greensburg railroad station. The inquiries related to chills and fever during the Spring and Summer up to the middle of July. At this latter date there were only three households in which the disease did not exist at the time, and one of these three had had it in the Spring. The total number of cases was fifty-one.

Dr. Lowrie very truly says: "Fifty-one cases of chills and fever in a total of twenty-three families is the expression of no small amount of misery."

Obviously there are no means by which the difficulty caused by the overflowing and saturation of the land by the mill-dam can be obviated without injury to the water-power. Therefore the simplest way to overcome it is the best way. The first step to be taken is to extinguish the mill right, and to remove the dam entirely, giving the brook for its whole length up to and through Mr. Fisk's estate a deep, clean and permanent channel. It would be better even that, wherever practicable, its bed should be at least four feet below the level of its immediate banks; the banks having a slope of two horizontal to one perpendicular, and being grassed.

I have been asked to give plans and estimates of the cost of this work, but I find that it would be impossible to do so even approximately, without a more careful survey of the ground than I have been able to make. Certainly the cost need not be considerable, and it can bear no comparison to the value of the result to be secured.

NOTES.

The Proper Treatment of Deciduous Hedges, and in particular of the Maclura or Osage Orange.

I. PREPARATION OF THE HEDGE ROW.

The ground should be in good condition, *i. e.*, dry enough and mellow enough to raise a good crop of corn. Spouty lands should be drained; low, wet places may be filled up by ditching, on either or both sides, raising an embankment, which should be fully eight feet wide. This may be done by the plow alone, or by using the scraper also, where horses can be worked, otherwise the spade must be resorted to.

Have your line surveyed before preparing it; find exactly where you want the hedge to stand, put a tall stake at each end, and perhaps several between, if it is a long line; plow first *out from the row on both sides* [See Fig. 1], then finish by *back furrowing*, so as to leave the row a trifle higher than the surrounding surface, to throw off standing water. Harrow and roll the ground well, and set stakes in a straight line with those at the ends, every five rods. Stretch a line of cotton cord, six inches to one side of these stakes, for a guide in setting the plants.

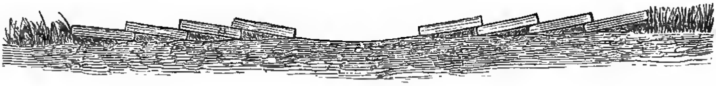


FIG. 1.

II. SETTING THE PLANTS.

This should be done in the Spring. Prepare the plant for setting, by thinning off all side roots, and cutting back the main root to about eight inches in length. The plants may be set in various ways, either by the use of the spade, dibble or trowel. The plan recommended by Warder, in his "Hedges and Evergreens," as being most sure of success and most rapid, is "to stretch a line upon the course of the future hedge, on the mellow and well-prepared soil; then a *clean* spade is pressed deeply into the ground, the blade being in a vertical direction and close to the line; pushing the handle from you, a crack is opened to the depth of the instrument; into this the little plant is inserted with the left hand, and retained in its position while the spade is withdrawn, and until it is turned with its face toward the operator and again inserted, at a distance of three inches from the first cut, in such a direction that, when pressed home, the edge shall reach the point of the first cut, near the place occupied by the root of the plant, where it is to be drawn firmly toward the operator, to fix the plant in its place. This operation is rapid and very simple; in its first introduction, the blade is to be perpendicular or vertical, with its back toward you; in the second, the *handle* is to be upright, and the cavity of the blade should be held toward the digger. The distance may be regulated by the eye, and a little practice will give sufficient accuracy."

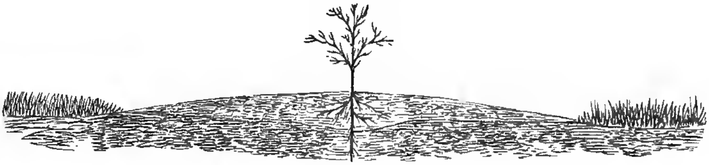


FIG. 2.—SHOWING THE YOUNG PLANT SET IN THE ROW.

Avoid two serious errors, viz.: (1) Crowding the row too near a fence, and (2) setting the plants too close in the row. Five feet is the least distance which the row should be planted from a fence, and the plants should not be set closer together than twelve, and, preferably, eighteen inches.

III. CULTURE DURING THE FIRST YEAR.

For the first year or two the main object is to make good roots. To that end do not trim the hedge any the first year. Keep the hedge row clean by frequent cultivation, just as you would a row of corn, and late in the Fall plow two rather heavy furrows to the row, forming a ridge about it to protect the roots; for if the tops be frozen, it is no matter, as they are to be cut off the following Spring.

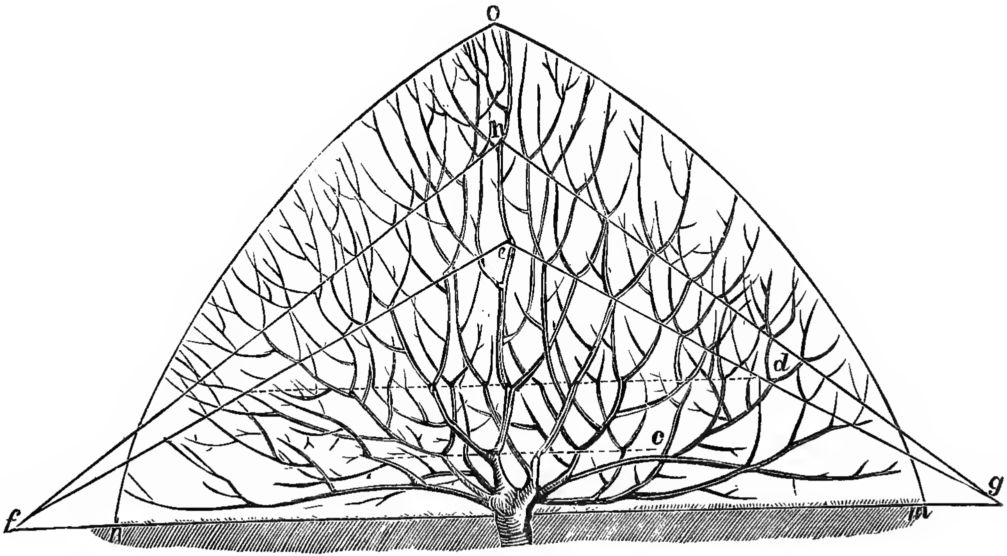


FIG. 3.

The line *c* shows where to trim in June of the second year.
The line *d* shows where to trim in the Spring of the third year.
The lines *ef*, *eg*, show where to trim in June of the third year.
The lines *hf*, *hg*, or *om on*, show the appsarance the completed hedge may be made to assume—either that of a letter **A**, or of a Gothic arch.

IV. CULTURE DURING THE SECOND AND SUCCEEDING YEARS.

A most important duty in the second Spring is to replace all dead or sickly plants with new, strong plants, cutting off the tops of the replants as they are set out.

The culture of the hedge the second season should be carefully attended to and the ground frequently stirred with the plow or cultivator, followed by the hoe when necessary. The following directions for trimming should be closely followed:

In the *Spring* of the second year, the whole of the wood is to be removed, by cutting off at the ground, with the scythe or mowing machine.

In June of the same year, or so soon as the multitude of shoots that will have made their appearance have become sufficiently woody to bear the knife, they are to be cut off at four inches from the ground (See Fig. 3). This will reduce the hedge to a low level, although the horizontal branches may spread over one or two feet, or more in width. No disturbance of the lateral shoots should be allowed, as they are wanted to give breadth to the future hedge; and *unless the bottom is provided at first, it can never be afterward supplied.*

The line *d* in the illustration shows the place for the cut to be made in trimming with the scythe in the Spring of the third year. The Summer pruning should be again performed in June, and should follow the lines *e f* and *e g* of the illustration, for now we must begin to give the hedge its proper form. The end view of a properly trimmed hedge should present the appearance of letter **A**. This shape secures to every leaf and twig the benefit of all the sunshine, air, rain or dew, that it is possible for it to receive.

Again, in August, the hedge should be trimmed, being careful to preserve the pyramidal form. These trimmings need not be so close as when we were forming the base. Six inches will do very well.

The trimming of subsequent years should be kept up on the same principle, being careful to preserve the slope of the sides which will gradually become more precipitous as years go by, but which must never be allowed to assume the perpendicular form.—[*Condensed from Warder's "Hedges and Evergreens," published by the Orange Judd Company*, 245 *Broadway, New York.*

Sidewalks and Roadways.—How to Make Them and How to Take Care of Them.

I. SIDEWALKS.

No one thing has more to do with the comfort of those living in the country, than sidewalks which are good at all seasons of the year.

To overcome occasional sloppiness where the difficulty is not deep-seated, there is no cheaper nor better device than to dress the surface with coal ashes. Indeed, if these are used to a sufficient thickness, they are practically as good as concrete or the best gravel. When first applied, they are dusty and unpleasant; but the first wetting lays the dust, and they soon settle to a firm consistency and make a very pleasant walk, with the great advantage of being entirely barren, and preventing the growth of weeds and grass.

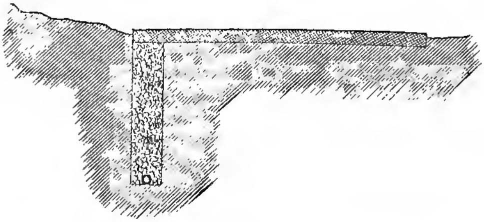


FIG. I

It is a common impression, that all thoroughly good footpaths must be dug out to a considerable depth, filled with loose stones, and dressed at the top with some good finishing material; but this is not necessary even for the best work. The great point is to secure a thorough draining of the sub-stratum, so that there shall be no rising of ooze-water from below, and so that the ground shall be free from such saturation as to cause heaving during frost. This condition may be secured by a suitable draining of the ground immediately under the walk, and by the use of a well-compacted and tightly-bound surface covering of such form as to shed or turn away rain water. Figure 1 shows the cross-section of a foot-path six feet wide, on slightly sloping ground, where we have to apprehend an oozing of subsoil water from the land at the highest side. The center of the walk is slightly crowning,—say one inch higher than the sides,—so that rain falling upon it will flow readily toward the grass border at either side. To prevent the ponding of water at the sides when the ground is frozen, the surface of the walk at its edges should be well above the level of the adjoining ground; but it may be necessary under some circumstances to furnish, here and there, a channel or surface gutter across the walk, to allow the accumulation at the higher side to escape. Rarely will deep gutters at the sides be necessary or desirable. We will assume that the path in question is to be made over a tenacious clay soil, with a considerable oozing from the hill-side,—the most unfavorable condition that can be found, especially in cold climates. The first thing to be secured is the cutting off of the subsoil water from the hill. This may be done by digging a trench as narrow as possible—six inches will be better than more, as requiring less filling material—to a depth of three feet. In the bottom of this drain lay a common land-tile drain, with collars at the joints, if these can be procured, and, if not, with a bit of paper laid over the joints to prevent the entrance of loose material, and to hold the pipes in place during construction. The ditch should then be filled with cinders, gravel, or coarse sand. If stones are to be used, they should be broken to a small size—not more than one inch in diameter—and the loose bits should be mixed with them in the filling. Very small interstices will be sufficient to allow water to pass freely through, while if large stones are used, with large interstices, there will be danger of a washing in of earth sufficient in time to obstruct both the stone work and the tile. The smaller the tile, so long as it is sufficient for its purpose, the better; for lengths of five hundred feet or less, an interior diameter of an inch and a quarter will be sufficient; from this to one thousand feet, use an inch and a half bore. If possible, before exceeding this length, secure an outlet for the water in the road-side gutter or some other channel of exit. The tile drain, at a depth of three feet, will remove all subsoil water from under the walk and all that may be delivered into the loosely-filled trench at its side. The loose filling of the trench should not be carried nearer than within six inches of the surface of the ground, and should be covered with fine and well-packed earth to prevent the entrance of *surface* water which would soon carry in silt enough to stop its action. Whatever covering is adopted for the walk itself, it must be of such a character as to prevent anything like a free admission of surface water. Concrete will do this perfectly; and either ashes, or gravel dressed at the top with ashes, if well raked and rolled at the outset to a smooth surface, will soon become so bound together as to shed pretty nearly all rain falling upon it. The difference in cost between a walk made in this way, and one dug out for its whole width to a depth of two feet, and filled first with stone and then with gravel and a suitable surface dressing, will be very important; and it is safe to say that the cheaper will be at least as good and durable as the more expensive method.

II. ROADWAYS.

The great expense of macadamizing or telfordizing puts these systems almost out of the reach of small communities. Wherever the original expense can be borne, the subsequent cost of maintenance will be so slight, and the result generally will be so satisfactory, as to make it always a good investment. The circumstances under which these costly forms of construction may be adopted will be greatly extended if we can overcome the prevalent American prejudice in favor of *wide* roadways.

Under most circumstances twenty feet of roadway will be ample. This will allow the moving of three vehicles side by side, and will give a leeway of six feet between two vehicles passing each other.

On both sides of this roadway, except for the necessary sidewalks, the whole space to the fences should be in well-kept grass, which is the cheapest to secure, the most economical to maintain, and the most agreeable to see, of all ground covering.

In considering the width to be given to roadways, it should be understood that every form of road is more or less costly to make and keep in order, and that the cost of both items is in direct proportion to the width. If to the cost of making and grading an ordinary roadway sixty feet wide, we add the capital sum whose interest would be necessary to keep this width in good repair, we shall have an amount that would go far toward the construction and maintenance of a road of the very best quality only thirty feet wide. Furthermore, while it is impossible to estimate such items exactly, and while the amount thus saved cannot be controlled for the road-making account, the saving in the wear and tear of vehicles, and in the team force needed to move heavy loads, constitutes an important argument in favor of the best construction. The amount thus saved in the short streets of villages, where the principal traffic is over rough country roads, would not be very great, but it would enable the road authorities of the township to realize the advantage of first-rate roads and the degree to which the narrowing of the roadway cheapens construction. As a result, there would soon be an extension of the improvement over the more important highways into the country, where a well-metalled width of twelve feet would accommodate nearly the whole traffic, and where the proper application of a cheap system of underdrainage would make well-metalled roads extremely cheap to maintain.

In the island of Jersey, there are many excellent roads only six feet wide. These are provided with frequent little bays or turn-outs to allow teams to pass each other. Although such extremely narrow roads are not to be recommended, the difference in comfort and economy of team-power between these and the average American dirt road is enormously in their favor. The widest roads in Jersey, leading from a busy town of thirty thousand inhabitants into a thickly-settled farming region where business and pleasure travel is very active, and where "excursion cars" carrying thirty or forty persons are constantly passing, are only twenty-four feet wide; often only of this width between the hedge-rows, the road itself being an excellent foot-path for its whole width. Nowhere else in the world is the rural charm more perfectly developed than in Jersey, and no element of its great beauty is so conspicuous and so constantly satisfactory as its narrow and embowered lanes and roadways.

The great enemy of all roads is excessive moisture; and the chief purpose of all methods of improvement is to get rid of this, or to counteract its effect. As in the case of foot-paths, wherever the porous character of the subsoil, and the absence of higher-lying wet lands, is such that no accumulation of water upon or under the roadway need be feared, the greatest difficulty is at once set aside.

Where such natural drainage is secured, no artificial underdrainage will be needed. In many more instances, all that will be required in the way of draining will be to lead away the sources of wet-weather springs, which break through the road-bed and cause deep sloughs. Where incomplete or partial artificial under-draining is needed, the need is absolute; and whether we consider the durability of the road, or the degree to which its traffic is interfered with by its wet condition, we may be confident that every dollar spent in well-directed under-draining will be invested to the very best advantage.

If the trouble is local, here and there in spots, and is obviously caused by the breaking up of springs from the road-bed, such partial work may be adopted as will tap the sources of these springs, and lead their water harmlessly away. Gisborne, one of the best agricultural writers of England, put the case tersely and well when—objecting to the system of circumventing springs—he said "*Hit him straight in the eye*, is as good a maxim in draining as in pugilism." It is best not to pass up at the side of a spring, and so creep around behind it to head off its water; but to drive the drain straight through it, and far enough beyond it to tap and lead away at a lower level the water which causes it. These drains, as well as all others intended simply to remove subsoil water, and not to cut off a weeping stream, are best made with common drain-tiles laid as before directed, and covered immediately with well-packed earth. Water enters an under-drain, not from above, but from below; that is to say, as water, from whatever source, fills the subsoil, it rises therein until it reaches the floor of the drain, when it enters and is led away, just as water falling into a cask which stands on end flows off at the under side of the bung-hole when it reaches its level. Even if the cask be filled to the top with earth, the rain falling upon it will descend perpendicularly to the bottom, and will flow off at the bung only when the soil to that level has become saturated. It will descend through the soil by the straightest course, and will raise the general level. It will not violate the laws of gravitation, and run diagonally toward the point of outlet, as seems to be the general supposition when the perplexing question, "How does water get into the drain?" is first considered. When we drive a drain through a spring and into the water-bearing stratum which feeds it, we simply make it easier for the water to escape by the drain than to keep on at the higher level, and break out at the surface of the ground.

As in the case of the sidewalks illustrated in Figure 1, in cutting off a continuous weeping or ooze from higher land, it is best to introduce a vertical filling of porous material through which the water will descend and enter the drain; but, excepting this single instance, all that we need to do, so for as subterranean work is concerned, is to furnish an easy and sufficient channel for the removal of subsoil water.

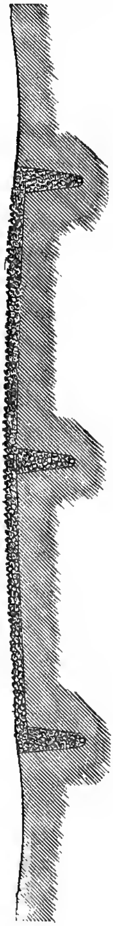


Fig. 2.

What constitutes a sufficient drain is something very much less than what is generally supposed. In ordinary agricultural drainage, where the lines of tiles are forty feet apart, a well-laid tile an inch and a quarter in diameter is sufficient for a length of one thousand feet—that is, it is sufficient to remove the water of filtration from an acre of land. If laid with only an inclination of six inches in one hundred feet, its delivery will be so rapid as to amount to more than a heavy, continuous rainfall upon this area. In road drainage, the same rule would hold true; but, as the soil offers a certain resistance to the rapid descent of water, it is best to give a means of outlet at smaller intervals; and for the best work in roads thirty feet wide or more, three drains could be used with advantage. In no case, however, need the size of pipes be larger than above indicated, if the form of the tiles is true, and if they are well joined together at their ends.

Figure 2 shows the cross-section of a country road thirty feet wide, with three lines of tile-drain laid at a depth of about three feet below it. Except in case of necessity, these drains should have an inclination of not less than six inches in one hundred feet. There is no objection to their having more than this wherever the lay of the land permits or requires it. They may often have considerably less in case of need; but, the smaller the rate of inclination, the greater the care needed in securing a true grade. The water of these drains should be collected into a single drain, and led away at intervals of from five hundred to one thousand feet. It may be delivered into a road-side gutter, or into a collecting underdrain, according to the requirements of the situation.

The removal of excessive subsoil moisture being secured, attention should next be given to the surface of the road, which should be finished with the firmest material at hand—with the common earth of the subsoil where nothing better can be afforded—and which should be brought to a true grade, with a *very slight* slope from the center to the edge. For a road thirty feet wide, the elevation of the center above the level of the edges should not be more than four or six inches, and the grade should be made on a straight line rather than on a curve. If the road is made as flat as the turning-off of surface-water will permit, it will be traveled upon in all its parts; while if it is crowned to a high arch, as is often the case, it will soon be found that the best place to drive is in the middle of the road, and foot-tracks and wheel-tracks will soon form slight channels or ruts which will lead water lengthwise along the road, and which will cause an undue amount of wear and washing. A road may be actually flat to the eye, and equally convenient for travel at every part of its width, and still have enough lateral slope to cause water to run off from it.

It is especially desirable that no surface-water flowing from the road-side (above all, when frost is coming out of the ground in the Spring) be permitted to run on to the road. This should be effectively prevented by the formation of sufficient gutters, with such outlets as will prevent ponding at the sides of the road. When it is necessary to carry the water of the gutters from one side of the road to the other, culverts should be provided; and wherever the slope of the road is sufficient to cause water to flow along it lengthwise—that is, wherever the inclination is more than about one in fifty—there should be frequent slight depressions *from the center diagonally toward the gutters* to carry the flow away before it can accumulate sufficiently to form a washing current.

If it can be done without hauling additional material, it is always well to raise the road-bed somewhat above the level of the adjoining land, and this may usually be accomplished by throwing upon it the subsoil of the gutters. *In no case should surface-soil, sods, or fine road-mud be used for repairs. The most serious objection to the absurd system of road mending so common in this country lies in the fact that the annual repairing is little more than the ploughing up and throwing back upon the roadway of the soft and unsuitable material which has been washed into the gutters.*

It is easy, in the country, to have the grades of all roadways so regulated as to shed rain-water falling upon them, and to have them so furnished with side gutters as to prevent water from the road-side from running on to them. The simplest way to effect this, and the neatest way, too, is to make gutters outside of the line of the road, say six inches deep and eight feet wide, these being at once sodded or sown with grass and grain to give an early protection against washing; made on such a shallow curve, they will afford no obstruction to any system of mowing that may be adopted, while their great width will give them sufficient capacity to carry away the water of considerable storms.

The work of construction having been duly attended to, it is no less important to provide for regular and constant care. Any rutting that comes of heavy traffic in bad weather should be obliterated either by raking, or, better still, by filling the ruts with gravel or ashes. *If such work is attended to immediately on the occasion for it arising, the amount of labor required will be very slight; for it is especially true with reference to roads, that "a stitch in time saves nine."* If the filling of ruts and wheel-tracks be done in time, the serious damage that comes from guttering flows of water lengthwise along the road may be almost entirely avoided. —[*Extracts, with permission, from Waring's "Village Improvements and Farm Villages," published by Houghton, Mifflin & Co., Boston, Mass. See, also, Gillespie's Roads and Railroads.*

Lawns—Best Mixtures of Grass Seeds.

Charles L. Flint, in his book entitled "Grasses and Forage Plants," recommends the following mixtures:

He says: "If the object be to make a permanent lawn, as is frequently desirable, around or in sight of the farm-house, something like the following mixture will generally be found to give satisfactory results:

	POUNDS.
Meadow Foxtail	2
Sweet-scented Vernal Grasses	1
Redtop	2
Hard Fescue	3
Sheep's Fescue	1
Meadow Fescue	4
Red Fescue	2
Italian Rye Grass	3
Perennial Rye Grass	6
Timothy	3
June Grass	4
Rough-stalked Meadow Grass	2
Yellow Oat Grass	1
Perennial Clover	2
Red Clover	2
White Clover	6
Total	44

This mixture will resist the effects of our severe droughts better than those commonly used for lawns. If anything is omitted from it, the red and perennial clovers, the yellow oat grass, and a part of the rye grass could best be spared. Red clover, like other coarse and large-leaved plants, rather mars the beauty of fine lawns; though, as it disappears mostly after the second year, it may be of service in protecting the finer grasses. Lawns kept frequently mown are of most use as furnishing food for calves and sheep, and are less adapted to supply the wants of larger animals.

Another mixture for lawns and pleasure grounds, which are to be often mown or kept short, is recommended by Parnell, as follows:

	POUNDS.
Crested Dog's-tail	11
Yellow Oat Grass	8
Hard Fescue	5
Wood Meadow	4
June Grass	2
Rough-stalked Meadow	2
Redtop	4
Whitetop	4
Total	40

Lawns furnished with suitable grasses become much finer and more velvety, from frequent mowing, than they otherwise would be. The Lawson's mixture, for lawns frequently mown, consists mainly of the same species, but in different proportions. It is as follows:

	POUNDS.
Crested Dog's-tail	10
Hard Fescue	4
Slender Fescue	2
Perennial Rye Grass	10
Wood Meadow Grass	2
Rough-stalked Meadow	1
Yellow Oat Grass	1
June Grass	8
White Clover	8
Total	46

A mixture for permanent lawn pastures, or pastures lying in the vicinity of dwellings or public highways, where the owner has some regard to fineness and beauty of herbage, should, I think, be composed of a still larger number of species.

The following is suggested as most likely to secure the end desired:

	POUNDS.
Meadow Foxtail	3
Sweet-scented Vernal	2
Orchard Grass	3
Hard Fescue	2
Sheep's Fescue	2
Meadow Fescue	2

	POUNDS.
Italian Rye Grass	3
Perennial Rye Grass	4
Timothy	3
Redtop	3
June Grass	4
Rough-stalked Meadow	3
Yellow Oat Grass	I
Red Clover	2
Perennial Red Clover	2
White Clover	4
Total	43

In all such mixtures the early Spring and the late Autumn growth, as well as the general luxuriance of the Summer herbage, are to be regarded. Grasses, therefore, which are characterized by their early and late growth, become of great value and importance in the mixture, even though their nutritive qualities are slight, and though they may be comparatively valueless as field grasses to be mown for hay."

Factory Adornment.

An important work of rural improvement in many towns, would be the betterment of the surroundings of their factories. Too frequently these grounds are disfigured with rubbish, and made unsightly by neglect. Keep a man in a pig-sty, and he would become swinish in his habits, but reverse these conditions, and you reverse the results. The influence of flowers, shrubbery, or neat and cultivated grounds, upon operatives, in refining their taste and promoting their happiness, I contend is too often ignored. There is, however, a goodly number of our most successful manufacturers, who show their interest in their hands by making their factory buildings and tenement-houses inviting, comfortable and healthful, and adorning the surrounding grounds.

The two model manufacturing villages of America, and, so far as I have been able to observe, of the world—the Cheney Silk Factory, in South Manchester, Connecticut, and the Fairbanks Scale Works, in St. Johnsbury, Vermont—happily illustrate the desirableness and results of better provisions for the taste and comfort of operatives. I do not assume that all factories can fully adopt the high standard of these remarkable establishments, which are exceptional in their opportunities. There are serious embarrassments in large manufacturing towns, especially where the factories are controlled by non-resident owners, more anxious for dividends than for the comfort and improvement of their workmen.

In the factories above named, there has evidently been mutual sympathy and interest between employers and employed. The senior Governor Fairbanks used to say to his men, "You should always come to me as to a father." He maintained relations of kindness with them, visiting the sick, helping the needy, counseling the erring, encouraging their thrift and enjoining habits of economy. He taught them that it was their interest and duty "to lay up something every month." He was a conspicuous example at once of strict economy and princely liberality. The fact that so many of the workmen here are "forehanded," besides owning their homesteads, is due to his teaching and example. The worth and dignity of work he illustrated in theory and practice. His sons worked in the shop and thoroughly learned the trade. Of course there is here the happiest conciliation between labor and capital. It is not strange that the workmen "hold on." Many have worked in this factory from twenty to forty years. The liberal provisions for the education, improvement, happiness and prosperity of the hands, explain the absence of discontent, and the uniform good feeling and harmony which prevail. How to harmonize labor and capital, is now one of the great questions of the age. Many millions of money have been lately lost in this country and in England, by needless antagonisms between those who should be partners.

B. G. NORTHROP.

The Lenox System of Sewage, as described by Col. Waring, in his "Village Improvements."

"The third system—the distribution of sewage through irrigation pipes laid at the depth of ten or twelve inches below the surface of the ground—has its efficiency attested by numerous instances in private grounds. I have adopted this system for disposing of the sewage of the village of Lenox, Mass., where there was no other means available short of cutting an outlet, at great expense, through a considerable elevation. This method is an extremely simple one, and is available in every instance where even a small area of land lying slightly below the level of the outlet is to be commanded. The arrangement of the sub-irrigation pipes is easily made: Suppose that in land having an inclination of about one in two hundred, occupied by grass or other growth, a trench be dug twelve inches deep, that there be laid upon the bottom of this trench a narrow strip of plank to insure a uniform grade, and that upon this plank is laid a line of common agricultural land-drain tiles, say two inches in diameter. However carefully these tiles may be placed, there will be at their joints a sufficient space for the leaking out of any liquid they may contain; the tiles being laid either with collars around the joints, or with bits of paper laid over them, to prevent the rattling in of loose earth during the filling. The excavated earth is to be returned to its place, well compacted, and covered with its sod. Suppose this drain to have a cross-section equal to three square inches, and a length of one hundred feet, its capacity will equal about sixteen gallons, or a half-barrel. If this amount of liquid be rapidly discharged into the drain, the inclination being slight, it will at once be filled or nearly filled for its whole length, and the liquid will leak away in tolerably uniform proportion at every joint along the line, and will saturate the surrounding earth. The plan adopted at Lenox, and recommended for all small villages which cannot secure a better outlet, is simply a multiplication of these drains to a sufficient extent.

A description of the manner in which the Lenox work is arranged will illustrate the adaptation of the system to its circumstances. As circumstances vary, the adaptation must be modified. (See Diagram.)

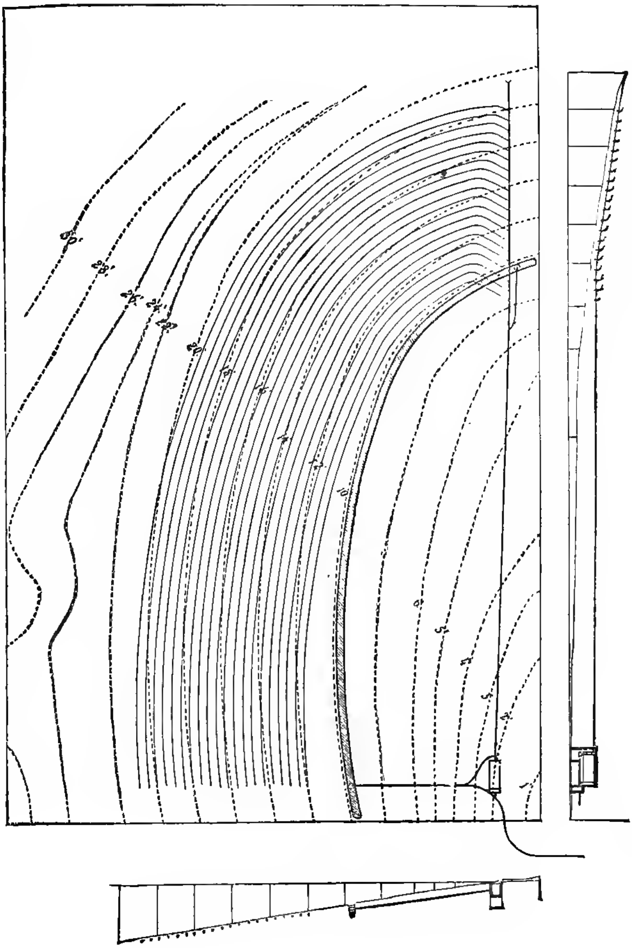


DIAGRAM ILLUSTRATING MANNER OF SEWAGE DISPOSAL AT LENOX, MASS.

The main outlet sewer delivers at a distance of about one-half mile from the last junction with a branch sewer. It is a six-inch pipe five feet below the surface of the ground, and it delivers into a flush-tank like that shown on page 51, but having a capacity of about five hundred cubic feet. This tank stands at the upper side of a field having an inclination of seven in one hundred. There is a branch from the main sewer, above the tank, supplied with a stop-cock, by which, in case of need, the sewage may be carried on down the hill without going into the tank. The outlet from the chamber below the siphon leads off in another direction down the hill, and has a stop-cock and a branch which will allow its flow to be diverted. The discharge of this diverted stream and the discharge through the branch of the main above the tank, both deliver into a horizontal surface gutter to be well grassed, and lying at the top of the land to be irrigated. By this arrangement, should repairs become necessary in the tank, the flow may be turned into the gutter; or, should it be desired for any reason to use the outflow of the tank for surface irrigation, the second branch outlet will deliver it into the same gutter, where, the outflow being uniform along the whole length of five hundred feet, the stream will pass in a thin sheet off on the descending ground. The hill-side immediately below the gutter, is brought to a true grade and covered with grass. As its inclination is much greater than would be admissible for sub-irrigation drains, these are laid *obliquely* in parallel lines at intervals of six feet from one end to the other over the whole graded slope. These drains are connected at their upper ends with the direct outlet-pipe leading from the siphon chamber. They have an aggregate length of about ten thousand feet. The method of operation is as follows:

The capacity of the tank is supposed to equal about two days' discharge, or about thirty-five hundred gallons; and the whole capacity of the drains is about half that of the tank, so that the rapid emptying of the whole volume into them will insure their being pretty thoroughly filled from end to end. This arrangement will provide for the saturation of the soil about once in two days, and will leave a sufficient interval between the periods of saturation for the thorough dispersal and aeration of the filth.

The extent to which this system will be interfered with by frost, it is impossible to say. This will probably be less than would be supposed, for the reason that the ground would often be covered with snow, and that the sewage will have sufficient warmth to exert considerable thawing influence. Whenever the discharge of the liquid through irrigation pipes is shown to have become obstructed by freezing, it will only be necessary to divert the flow, and turn it into the surface gutter to be distributed over the ground.

It is possible that in this case, as in the one which has been under my observation for six years past, there will be no interruption of the working because of cold; but, should the interruption become serious, I shall propose the planting of evergreen trees in parallel rows midway between the drains. The protection that would thus be afforded, both by the trees and by the drifting snow which they would gather, would probably keep the ground free throughout the Winter. Incidentally to the chief advantage of this system, there will be, so long as the land is in grass, quite an addition to its product."

For further information, see Col. Waring's Report, in the preceding pages.

Drainage for Health.

Col. Waring discusses fully the subject of the disposal of house wastes and protection of wells. The object of this note is to impress a not less important point, viz., the duty of securing such subsoil drainage as will insure dryness of the site of foundation walls and of the cellar.

Lord Bacon has said: " He who builds a fair house upon an ill seat, committeth himself to prison."

As a rule, the dry soils, sand and gravel, are the healthiest. Coarse gravel is also the safest soil to build upon, as it is almost incompressible and makes a firm foundation.

While typhoid fever and diphtheria are conceded to be generated and their virulence increased by impure air and water, two other prevalent scourges, *consumption* and *fever and ague*, are caused by the influence of stagnant water and excessive wetness of the soil; and they may be much alleviated by the simple removal of the drainage water, through exactly the same process that is employed in farm drainage.

We will consider first the mode to be adopted to secure

DRYNESS OF SITE.

As our space is limited, we must ask the reader to be content, on many points, with simple rules and directions, without discussion of reasons.

To drain a tract, large or small, find an outlet low enough to give the necessary fall—one foot in one hundred is sufficient, and drains will work well with but one-quarter of that fall. If the fall is slight, the greater care will be necessary in laying out and performing the work.

The work should be all laid out before breaking ground. Usually a single main drain should run through the lowest part of the tract, and it is not important that the main should be straight as to line, but there must be no inequality in the grade. Having laid out the main, lay side drains running into it, having in view two principles: First, to run each drain up and down the slope of the land, rather than across; and, second, to have them parallel to each other. Like most principles, we shall be compelled often to compromise them. The depth should be four feet or more, and the distance apart, with this depth, may be from thirty to fifty feet.

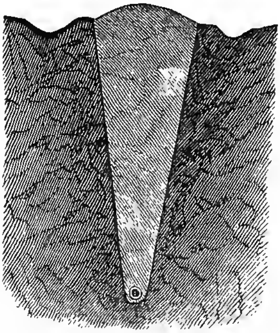


FIG. 1.—PROPER SHAPE FOR A TRENCH.

To open them, begin at the outlet, so that the water may run off as the work proceeds, and with a common spade and pick, cut a trench by a line, eighteen inches wide at the surface, narrowing to four inches, or the width of a laborer's boot, at the bottom. To finish the bottom, a spade four inches wide is necessary, and may be made by getting a blacksmith to cut down a common long-handled shovel to that width, no wider at the heel than the point. Common drain tiles are recommended, and the directions given are specially adapted to their use.

The drains being thus opened, we begin to lay the tiles at the upper end. Lay the first tile (usually of two-inch size) with a brick or flat stone over the upper end, to close it entirely, and the next end to end with it, and so on to the main, keeping always an inclination, however slight, for if any depression is made, the silt will lodge in it and obstruct the work.

Here let this idea be fully impressed: In this system of drainage no water is to be anywhere admitted except by percolation through the soil. There is to be no opening to the surface, or into any ditch, or to receive sink-water, or anything but clear water creeping underground.

But how does the water get in? Chiefly at the joints, which are as close as two rough bricks laid end to end would be. Nothing short of cementing the joints can keep the water out. The great difficulty is to keep out silt or fine sand.

Having laid two or three tiles on the bare earth, if hard (and on pieces of laths or other thin wood, if soft), cover each joint half or more round the tiles with a piece of tarred paper as large as a common letter envelope, and, holding the whole firmly, place soil or gravel over it and on both sides of the tiles, pressing it enough to keep them in place. However tempted to do so, put no stones nor straw nor shavings into the drain. Cover and fill up with anything at hand except soft clay, fine sand or sods, which should not be placed in contact with the tiles.

When we approach the junction of the minor drain with the main, a curve should be made, so as not to bring in the side stream at right angles. Branch tiles may be found made for the purpose of junction, and these are much better than any home contrivances. The last few feet of the main should be of vitrified pipe, with cemented joints.

Having thus connected the drains in one system with only one outlet, this should be so secured by a wire grating that no frog or other creeping thing can explore it, and it should be built up solid with stone, so as to be permanent, and should have a clean fall of a few inches upon a flat stone, that it may not be obstructed by back-water and mud.

The above instructions, if followed, will insure a dry site, but in the case of particularly springy ground, or where a house is situated on a side hill, it may be well to drain the cellar itself.

This may be done by digging a trench as above directed, in the cellar, as close to the wall as it can safely be dug, and to a depth six inches below the bottom of the foundation. The bottom of this trench should have a slight but regular fall toward the point where the pipe can most conveniently be carried under the foundation to an outlet built as above directed, and the last few feet will be best constructed of vitrified pipe, with tightly cemented joints, in order to make a lasting job.

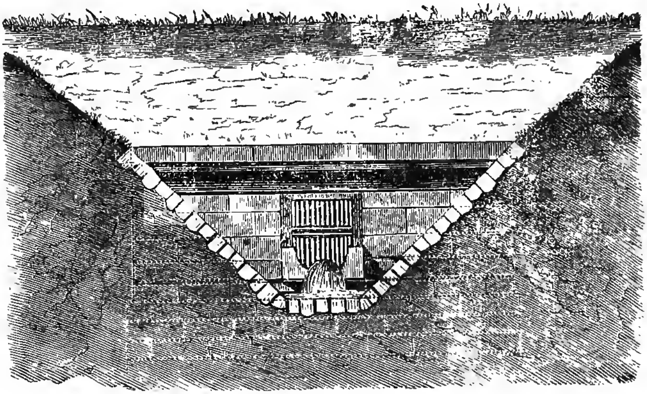


FIG. 2.—OUTLET.

Under no circumstances should these pipes be connected with the sewer pipes or cesspools.

By this simple method damp walls and cellars may be entirely cured at a small expense for material and about a day's labor of a couple of careful men.

The directions given above for laying the pipes and filling the trench should be exactly followed.

It has been scientifically demonstrated that damp sites, and particularly damp cellars aggravate and to a large extent produce consumption and malarial disorders. It is a fact that where the drainage of building sites and of cellars has been attended to, deaths from consumption have fallen off fifty per cent.

Which are of *greater value*, the few dollars it will cost to make our homes healthy, or the life and health of our wives and little ones?

Which will *cost less,* to spend a few dollars in prevention, or many dollars in the cure or attempt to cure disease?

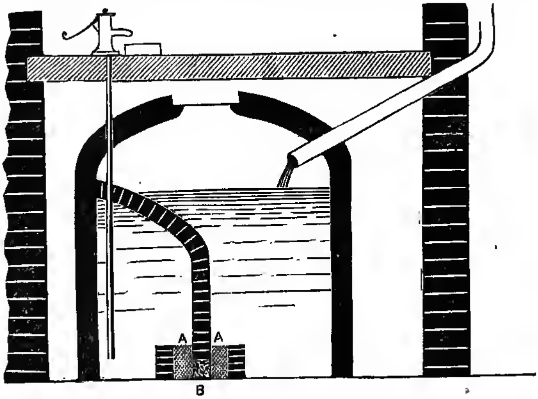
[*Condensed from the Fourth Annual Report of the State Board of Health of Massachusetts.*

Filtering Cisterns.

As there may be some of our members who propose constructing cisterns for retaining their supply of drinking water, the following description and illustration from "The Sanitary Engineer" for November 1st, 1880, are given:

"The best material for rain water cisterns is brick, laid in hydraulic cement and plastered inside. No lime should be used for the plastering, but a mortar made of equal parts of cement and good, clean, sharp sand. This is rarely found clean enough to be used without first washing it. After the plastering is hard, it should be washed twice with a grout of cement and water, without sand, applied with a white-wash brush. If the ground is firm, and stands plumb without caving in, one layer of brick laid directly against the side of the pit is enough. In this case the form of the pit should be carefully trimmed to a true circle, and the walls trimmed plumb. Then the brick work can be laid directly against it, filling all small cavities between the brick and ground with cement, and not with earth. If the ground is not firm enough to stand in this way, a thicker wall will be needed, say eight inches. The earth that is filled around it should be puddled in with plenty of water, to ensure a solid packing. Ramming the earth without puddling is not so good, and will not be likely to prevent the cistern from bursting when first filled with water. A very small crack will spoil it. The floor can be laid after the walls are plastered, so as to avoid stepping on it much after laying it. The floor should be dished like a saucer, to facilitate cleaning out.

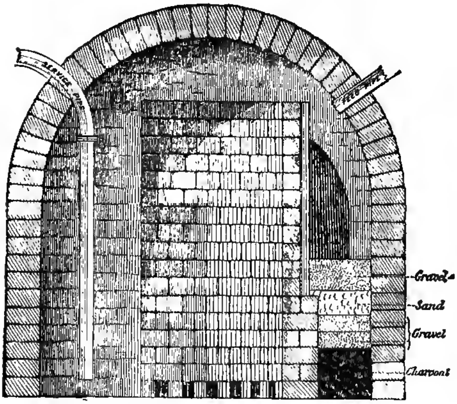
"For filtering, build a partition in the cistern by which any portion, say one-fourth, of its contents can be separated from the remainder. Insert the suction pipe or pump within this chamber, and allow the inlets to discharge outside of it in the larger part of the cistern. If the partition is built of one thickness of soft, porous brick, the water will soak through it; but this brick partition should be domed over against the side walls to prevent any pollution of the filtered water by dust or spatterings from above. If the water is quite foul, the pores of the bricks will be choked in time, and refuse to pass more water. In that case the partition must be renewed, or holes made near the bottom, in which sponges, broken charcoal or sand can be placed to do the work; and these can be renewed when found necessary.

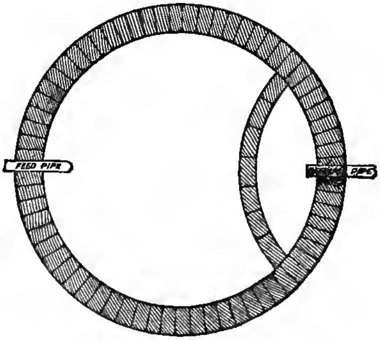


"If gravel and charcoal are used, they are deposited in layers, charcoal at bottom, and a few inches of gravel on top, each side the filtering wall at *A A* [see cut], and confined by dwarf walls on each side. Holes are left in the base of the filtering wall by omitting alternate bricks in the bottom course. The water is then filtered by passing down through one bed of charcoal and up through the other. The gravel is chiefly useful to put on top of the charcoal to protect it from wash.

"This charcoal will need frequent renewal if there is much solid matter in the water. Hence two cisterns are convenient."

Two other illustrations are given, showing a somewhat different construction. These are taken from "Wood's Household Practice," a valuable work on hygiene. They explain themselves sufficiently without need of description.





Heating and Ventilation.

The object of this note is to explain in a simple way how we may keep our houses comfortably warm in Winter, and yet not compel ourselves to breathe over and over again air which has become dirty and foul from washing out our lungs and contact with our bodies.

Col. Waring has entered a plea for "a pure soil" and "pure water;" now, pray heed Hippocrates once more, and be sure you have an ample supply of pure, life-giving air in your dwellings.

Dr. Hamilton Osgood, in his admirable little book on "Winter and its Dangers," says: "Human beings, as well as fish, live, move and have their being in a fluid. That in which we find fish is visible, and its slightest impurity noticeable. Not so the fluid in which we live. It is invisible, and, in a general sense, so are its impurities. Eyes being of no use here, the sense of smell, if properly regarded, will be our protector. When the air of our rooms is foul, when drains are imperfect, when any impure thing taints the atmosphere, the sense of smell gives us warnings which should be religiously regarded and never neglected.

"The air in which we live, and which we inhale, is composed, when normally pure, of eighty parts nitrogen, about twenty parts of oxygen, and a small quantity of carbonic acid, say about four-hundredths of one per cent. When absolutely pure, the air, of course, is absolutely free from this poisonous element. Our health depends upon keeping up the twenty per cent. of oxygen and keeping down the carbonic acid to its lowest possible minimum. An increase of this gas to five or ten per cent. would be fatal to life.

"When the blood leaves the lungs, it is in the condition called arterial—that is, it has been purified by the air, or aerified. And the name artery originated in the fact that, until the time of Galen, in the second century of our era, the blood-vessels leading from the lungs and heart were supposed to convey air directly from the windpipe, and air only, because after death they are always found empty. It was thought that the veins, the vessels which bring the blood back to the heart and lungs, were the only channels of the blood, for after death they were always found full.

"The blood carries myriads of small bodies called blood-corpuscles, which, with the exception of a few white ones, existing in the proportion of about four to one thousand of the red, have a color which is bright red when the blood is pure or arterial, purplish or dark crimson when the blood is impure or venus. These bodies have aptly been compared to boats. When the blood leaves the lungs, these boats carry a mixed cargo, an important portion of which is oxygen. This they discharge as they pass through the canals of the body, some stopping here, some there; but they always exchange it for an equal load of carbonic acid. This carbonic acid changes the color of these dainty boats from dark to bright red. When they reach the lungs again, they expect to find a new cargo of oxygen, and likewise to become purified and restored to their original brightness. Consequently, when the air inhaled by the lungs is once in the air-cells, which cluster about the finer bronchial tubes like grapes upon their stems, the pure air finds a quantity of carbonic acid which has been brought by the boats that have just arrived from the rivers and canals of the body.

"By a wonderful process of which gases are capable, the carbonic acid from the boats and the oxygen from the inspired air both pass through two exquisitely delicate walls which separate the blood in the vessels from the air in the air-cells of the lungs, and exchange places—the air in the lungs take the carbonic acid from the impure blood, and becoming itself impure; the blood-corpuscles, or the boats, taking the oxygen from the pure air (*if only it be pure*), and thus becoming purified. Where this latter takes place, the air-cells lie in a perfect mesh of the most delicate vessels conceivable. The walls of each are so exceedingly thin that the transfusion or passage through them of the two gases is made possible. But for this delicacy of construction, the exchange could not take place. The freshly-laden boats now start on a new trip, their places being instantly taken by others. The impure air is exhaled, and the new inspiration sends fresh air to the air-cells and the waiting boats. And so this wonderful process of exchange goes on day and night, whether we are sleeping or waking."

"It is undoubted," says the same author, "that affections of the lungs, notably consumption, find their origin in inhaled air which is laden with organic vapors and particles arising from the human body." He also attributes bronchial affections, "colds," lassitude, head-aches and general dibility largely to the breathing of impure air.

"Think, too," he continues "of the air of church, theater and crowded parlor. Go into such from the fresh air an hour after the company has assembled. How heavy the air with personal effluvia and rebreathed breath. Pah! these delicate women have no thought of what they are doing. Offer such an one a cup of ditch water; would she drink it? Would she drink it if it contained even a speck? No. And yet think of it: in unventilated rooms and crowded assemblies, we inhale dirty air—air which has washed out other lungs than ours, some of them probably in a state of disease! Such air contains personal impurities, particles from the lungs, uncleanly odors. Such air drawn into sensitive lungs—lungs which are only waiting to spring into inflamed conditions—creates disease." * * * * "God gives us pure air. Is it not a sin and a shame that we do not keep it pure? Think, too, of the sick, of the delicate, of the children who are confined to the house. They are mainly helpless. For their pure air they are dependent upon the foresight of others, and it is just as cruel to keep it from them as it would be to deny them food, and almost as dangerous. *Their lives depend upon it. They die for want of it.*"

One other quotation, and then we are done: "It is a very common belief that night air is unhealthful; but, as Florence Nightingale sensibly remarks, 'we must breathe night air at night;' and she might have added: if pure night air is shut out, then we breathe foul night air." * * * * "Statistics show that where war has slain its thousands, bad night air has slain its tens of thousands; then do not fear, but welcome the pure air of night."

"Better is it," says a wise writer, "to spend money on a supply of pure air than on carven work and orations."

How to obtain this supply of pure air in the Winter months, without producing draughts and without causing an undue waste of fuel, I now propose to state in a few plain words. Those who desire to study the subject more fully, I refer to the series of articles on the subject in "The Sanitary Engineer," by Dr. John S. Billings, U. S. A.

Most country-houses—and to those, these remarks are intended more particularly to apply—are provided with ample fire-places. Let the first step taken be to open these, substituting for the tight fire-board either such screens as are used in windows in the Summer time; or, better yet, let the andirons be polished and placed on the hearth as in "ye olden time." You now have provided a means of escape for the foul air which is constantly entering the room from lungs and lamps and emanations from your bodies.

Now, it is necessary to replace this bad air which you have sent up the chimney, with "good, pure country air." This may be done, of course, by opening windows or doors, but we all know that in the cold Winter time this would be, to say the least, very uncomfortable. The cheapest and simplest way to introduce pure air without causing draughts, is to provide several strips of wood one-third of an inch thick, of various widths, from two to six inches, and long enough to fit the window-frame under the lower sash. The latter is then raised, and the strip inserted under it, thus closing the aperture. There will, in this way, be left between the upper and lower sash a space where air can enter, which may vary in size with the weather, according to the thickness of the strip used. The air coming through this space is deflected toward the ceiling by the lower sash, and thus enters the room without any danger of causing a draught or otherwise annoying the occupants. [Fig. 1.]

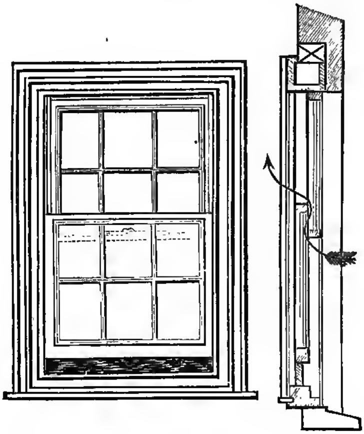


FIG. 1.

The method just described will be useful at all seasons, when it is necessary to keep windows and doors closed, especially in stormy weather in Spring, Summer and Fall, and in the cool, Fall evenings before the fire is started.

The following suggestions from an article by Rev. Daniel C. Jacokes, in "Carpentry and Building," for November, 1880, are admirably adapted for houses mostly heated by stoves and not provided with open fire-places:

"During cold weather, ventilation should be produced by the aid of heat. The following rules should be carefully observed in heating and ventilating:

"1. Conduct, in some convenient manner, out-door air against a heated surface.

"2. Conduct the in-door air from the floor into a heated flue. In this manner a complete circulation of air may be had, and an abundant supply of pure warm air may be secured; provided, first, that the ducts be sufficiently large; and, second, that the dust in the air be not burned by a red-hot surface. If these rules are observed, the heating and ventilating will be very economical and satisfactory. Most of the buildings, pub-

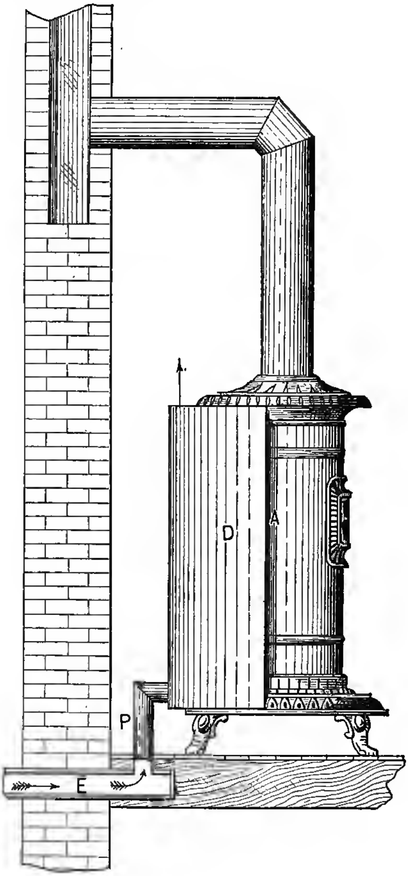


FIG. 2.

lic and private, for human use are constructed without any reference to ventilation; indeed, most of them seem to have been planned to prevent the possibility of either the light of the sun or the pure air of heaven entering them. There is, consequently, much difficulty in properly heating or ventilating them. Those who prefer health to the sight of the changes necessary in each case to secure such an end, must not object to see an additional pipe to convey foul air out of the room, and, also, a pipe to convey the pure outdoor air into it.

"There are many buildings heated by a furnace. In these the pure outdoor air is properly heated; but where there is no preparation for ventilation, this may be secured in the same manner as when heated by a stove.

"The great majority of houses are heated by stoves. The outdoor air in such cases must be conducted to the surface of the stove, as illustrated by the following diagrams. These stoves have various shapes; whatever they may be, the principles will here be explained, so that any person may modify the method so as to secure the result desired. Fig. 2 shows how a sheet-iron jacket may be fitted to the back of a stove for heating the outdoor air brought within the jacket against the stove. The jacket is seen at the top of the stove, and is represented by the line marked D. The jacket should never be more than 4½ inches from the back of the stove, and should always be closed at the bottom, so that the air in the room will never be reheated and breathed over and over again. This should be remembered. whatever kind or form of jacket is used.

"Fig. 3 illustrates the manner of conducting the outdoor air to the stove within the jacket for heating.

"A wood stove may be jacketed in the same manner as a coal stove. In this case the jacket may be fitted to the sides of the stove very nicely, covering the back of the stove in the same manner as the coal stove, so that the sheet-iron jacket will be at an average distance of 4½ inches from the back; never more than this.

"Outdoor air may also be heated by conducting it within a jacket around the stove-pipe of a wood or coal stove, as shown in section in Fig. 4.

"In school-houses, where box stoves are mostly used, a sheet-iron jacket may inclose the stove excepting the front, which should be left open for the escape of the heated air. The space between the stove and jacket should be 4 inches—not more—on the sides and top; on the back the jacket may be as wide as the hole in the floor—6 inches. An opening should be made through the floor at the back end of the stove near the jacket, 6 by 16 inches, if the jacket is wide enough to cover it. A pipe, the shape of the hole, should be fitted so as to reach a little above the bottom of the stove, that the air may reach the heated surface at once. Fig. 3 shows this arrangement.

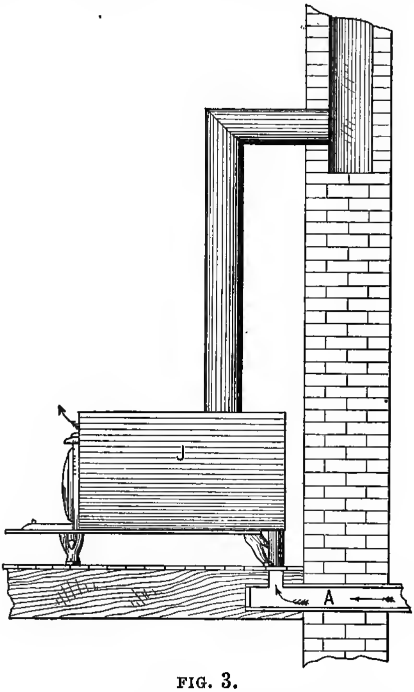


FIG. 3.

"Ventilation, according to rule second, should always convey the indoor air from the floor into a heated flue. If the chimney is properly constructed, this may be done with little expense or trouble. Usually, however, this is not the case. The general rule is to build chimneys very small—mostly 4 by 12 or 16 inches on the inside. This narrow space will soon be more or less filled with soot. In such cases ventilation will be difficult, if not impossible. If the chimney has been constructed with an apartment for ventilation, it will be sufficient to make an opening into it at the floor—that is, the bottom of the opening

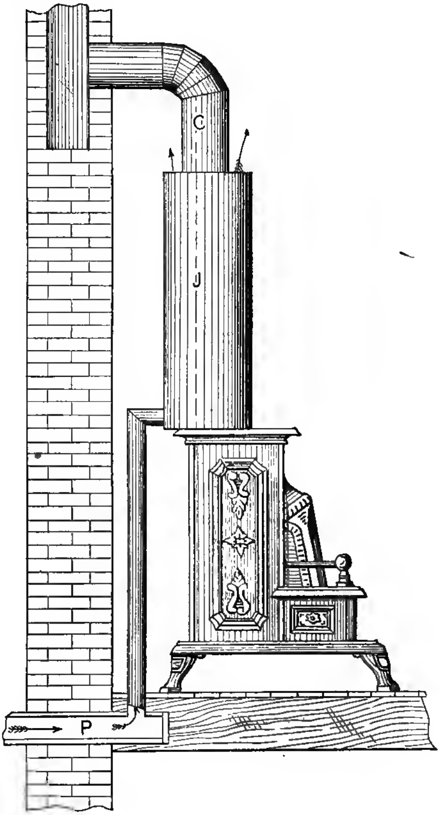


FIG. 4.

must in all cases be exactly even with the top of the floor, otherwise the ventilation will be imperfect; this will give good ventilation. All chimneys should be constructed with an apartment for each story, as shown in Fig. 5, and should be plastered smooth; the partition should be made of brick, and built single width, so that it will be four inches thick. This wall will be constantly heated to keep a continual draft in the ventilating flue.

"If a chimney is sufficiently large, a 7 or 8-inch stove-pipe—or larger, if possible—may be let down inside of the chimney and turned into the room at the floor by an elbow; this will make an efficient ventilator. If there is not sufficient room, or if for any other cause, as a crooked chimney, this cannot be done, ventilation may be effected as illustrated in Fig. 6. Take a pipe one inch smaller in diameter than the supply pipe which is to conduct the outdoor air to the stove, and carry it into the chimney—if possible, below the entrance of the smoke-pipe. This plan can be adopted more frequently and at less cost than any other, as chimneys are generally constructed.

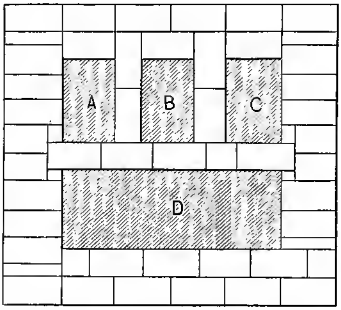


FIG. 5.—CONSTRUCTION OF CHIMNEY FOR BOTH SMOKE AND VENTILATION. D, SMOKE FLUE. A, VENTILATION FLUE FOR FIRST STORY. B, VENTILATION FLUE FOR SECOND STORY. C, VENTILATION FLUE FOR THIRD STORY.

"In many houses the chimney is so constructed or situated that the ventilation would not be equal to the work required. Such an instance would be when the chimney is short, the bottom being near the ceiling in the upper story, with a stove in each story connected with it. In such cases ventilation would be hardly possible. To remedy this the following plan may be adopted: The stove-pipe in the second story may be surrounded by a much larger pipe; a 6-inch pipe may be surrounded by a 10-inch pipe; a 7-inch by a 12-inch jacket pipe, and the ventilator may be connected with this surrounding jacket. The stove-pipe and the jacket are both to be carried into the chimney as one pipe; the stove-pipe within will so heat the surrounding air that a strong ventilation will be the result. The ventilator should enter the jacket at or near its bottom, as seen in Fig. 7.

"This plan, as well as the others recommended, will secure good heating and ventilation at a very moderate cost. I have

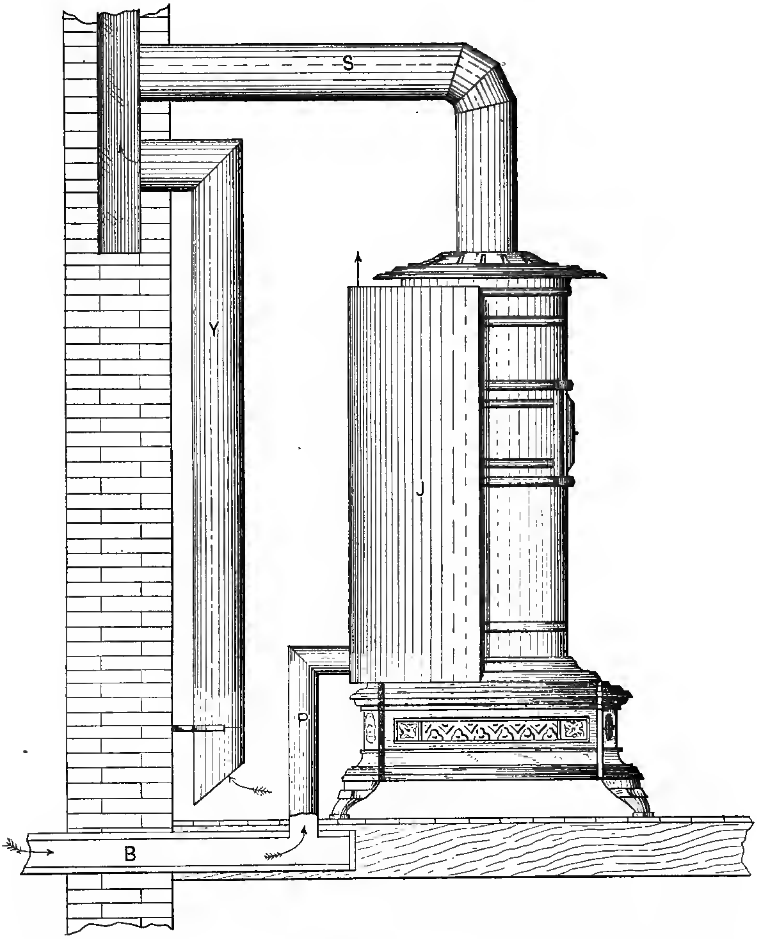


FIG. 6.—A METHOD OF VENTILATION WHERE PROPER FLUES HAVE NOT BEEN PROVIDED. S, STOVE PIPE. V, VENTILATOR PIPE, 6 INCHES DIAMETER, AND OPEN NEAR FLOOR. B, SUPPLY OF OUTDOOR AIR. P, SUPPLY PIPE (OVAL IN SECTIONS). J, JACKET OF STOVE.

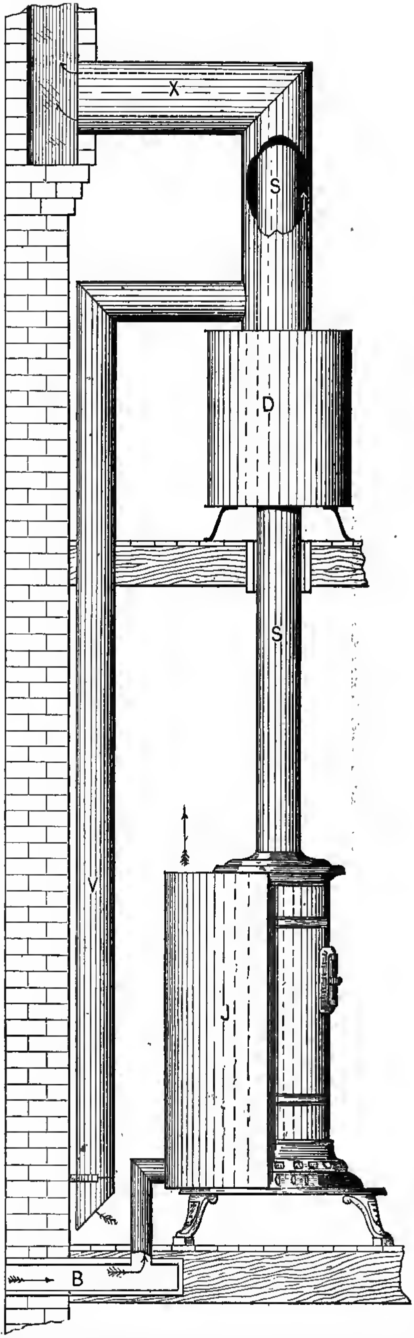


FIG. 7.—METHOD OF VENTILATION WHERE FLUE OPENING IS IN SECOND STORY. B, SUPPLY OF OUTSIDE AIR. V, VENTILATING PIPE. S, STOVE PIPE. J, JACKET TO STOVE. D, DRUM, LOCATED IN SECOND STORY. X, JACKET TO STOVE-PIPE, BY WHICH THE AIR WITHDRAWN FROM LOWER ROOM IS SOMEWHAT HEATED BEFORE ENTERING CHIMNEY FLUE.

known it to cost from ten shillings in the simpler forms to ten dollars by the more complicated forms; so that healthy and comfortable homes may be enjoyed by the poor as well as by the more favored of our fellow-citizens.

"The ventilation of churches, schools and other public buildings where large numbers of persons assemble, is of the highest importance. The general practice is to construct very small chimneys, which renders it difficult to secure efficient ventilation. In all these cases it would be better to reconstruct them, making them, say, 16 by 36 inches inside, dividing the space into two or more apartments, if there is one story to be warmed, or into three if two stories—one for the smoke, the others for ventilation—with an opening into each ventilating flue, always at the floor. One church has a chimney 16 by 36 inches inside, divided by putting a 16-inch pipe of heavy sheet iron so as to make the side flues of equal size; the pipe is fitted close to the brick wall to secure it to its place. This is the smoke-pipe, and it warms the air almost instantly in the foul-air flues at its sides, making a very powerful ventilator. This church has a basement story, and needs two flues, one for each room. If this pipe should ever be destroyed, another can be slipped inside of it and thus renewed. In public buildings which are heated at intervals this sheet-iron pipe is the best, as it heats the air on each side at once. In a building constantly heated the best way would be to build the partitions in the chimney with brick. The flues should always be plastered smooth. When this cannot be done, the ventilation must be made in the same manner as for dwelling-houses, the ventilating pipes being correspondingly large.

"In another church a jacket pipe 16 inches in diameter was put around a stove-pipe 7 inches in diameter, connected with a stove—all in the room below—and carried into the chimney. The end of the jacket opposite to the chimney was turned up through the floor by an elbow to receive the foul air of the room above and discharge it into the chimney. The 7-inch pipe enters the 16-inch pipe about four feet from the end furthest from the chimney, and passes through it to the chimney. A fire in the stove below will warm the foul air in the large pipe, and thus carry it away into the chimney. This fire must be made as soon as that made in the furnace or other heating apparatus, and continued as long. This church is finely heated and ventilated. [See Fig. 8.]

"Another church, which is heated by a furnace, is ventilated in the following manner: It has a chimney 16 by 36 inches inside; to secure good ventilation a hole is made through the floor near the chimney 16 by 20 inches inside; a tube is fitted into this, and reaches down into the room below, near an opening made into the chimney; an elbow connects the tube with the chimney; the foul air from the room above passes through this tube into the chimney below, and this ventilates the church, giving it pure warm air. The opening into the chimney is made below the entrance of the smoke-pipe from the furnace, so that the smoke does not enter the ventilating tube. [See Fig. 9.]

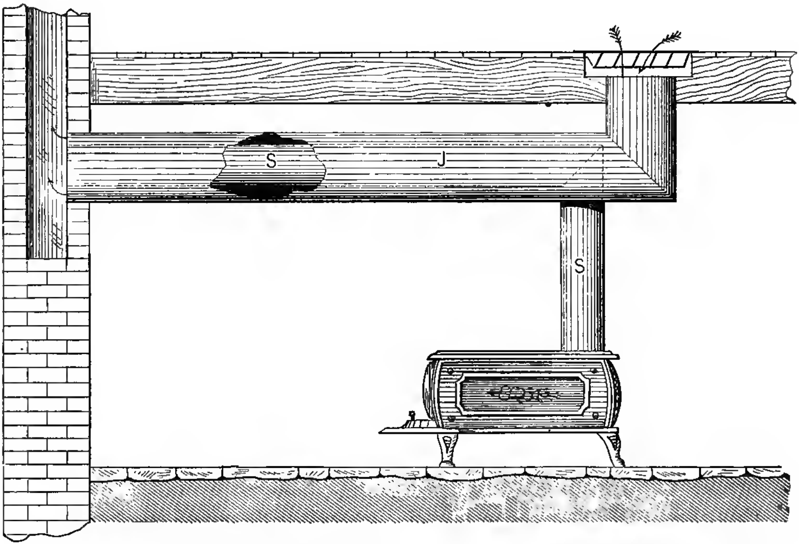


FIG. 8.—A METHOD OF VENTILATING CHURCHES. THE PIPE OF A STOVE IN THE BASEMENT IS JACKETED THROUGHOUT ITS HORIZONTAL LENGTH, THUS INDUCING A DRAFT FROM THE OPENING IN THE FLOOR ABOVE CONNECTED WITH IT. S, STOVE-PIPE. J, JACKET AROUND STOVE-PIPE.

"In all these illustrations the two rules given have been observed, and may be applied in many other forms: First, conduct the outdoor air against a heated surface; second, conduct the foul air in the room from the floor into a heated flue, and good heating and ventilating will be secured."

The introduction of fresh air and removal of foul air simultaneously is accomplished in an almost perfect manner by the stove illustrated in Fig. 10. It has a large drum above the fire, surrounded by a jacket, so arranged that a constant supply of fresh air may be brought into contact with greatly-expanded surfaces, which absorb the maximum quantity of heat, and impart it rapidly to the in-flowing currents—thus preventing over-heating, and at the same time supplying the room with an abundant, genial and invigorating atmosphere. It will be observed that two distinct currents pass through the stove. One enters beneath the grate, ascends to the chamber above, passes over the diaphragm therein, and thence goes to the chimney, furnishing the draft. The other enters under the stove, and becomes heated by contact with the hot surfaces, and rises through the jacket, thus compelling a constant circulation through the latter. The

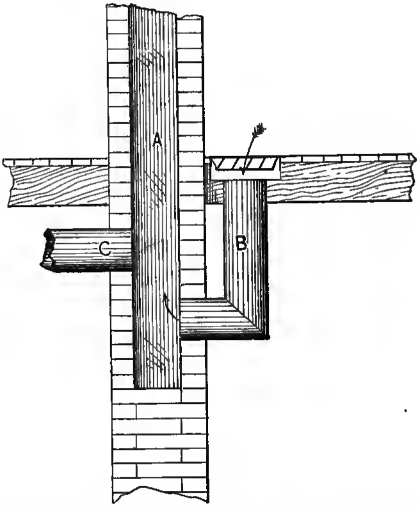


FIG. 9.—VENTILATING A CHURCH BY CONNECTING AN OPENING IN THE FLOOR WITH THE MAIN CHIMNEY FLUE, MAKING THE CONNECTION BELOW THE ENTRANCE OF THE FURNACE-PIPE. A, CHIMNEY FLUE. B, VENTILATION TUBE. C, POSITION OF FURNACE-PIPE.

fire is entirely open, so that a large supply of additional heat is radiated therefrom. The construction, evidently, is such that there is no opportunity for leakage of the deadly carbonic acid gas; nor is there any contact of highly-heated plates with the air of the room to generate carbonic oxide.

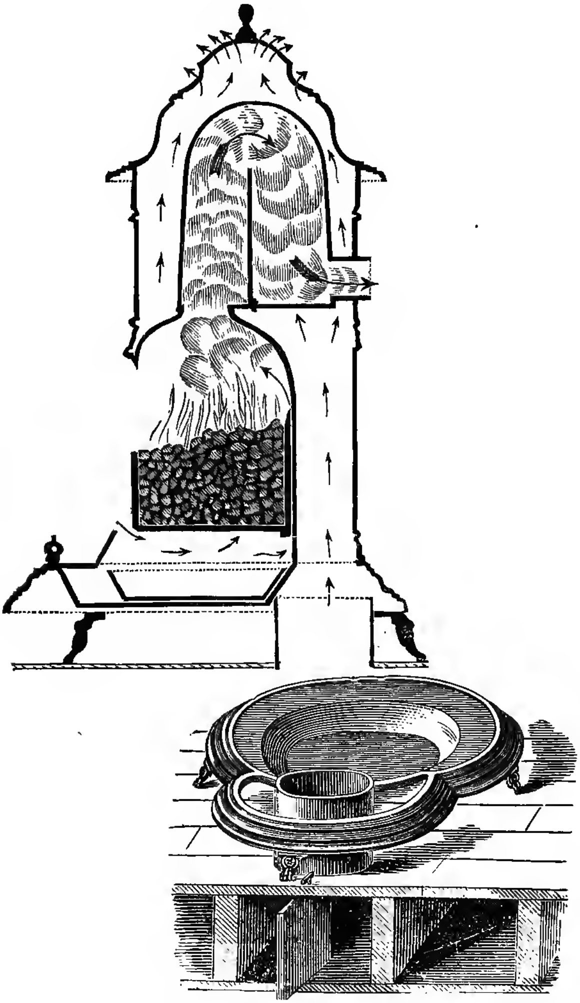


FIG. 10.

By its use the entire atmosphere of any room may be replaced every fifteen or twenty minutes, with a supply of invigorating, refreshing out-door air, moderately warmed, and not dried, parched and devitalized; and the air supplied for breathing may be rendered as pure and refreshing as the outdoor Summer air.

And now that we are on the subject of heating, it will be in place to warn householders against too great heat and too dry heat. Too much cannot be said to impress on all householders the great value of keeping all parts of the house—halls, and best rooms, and bed-rooms—as well as the kitchen and living rooms, comfortably warm. Many a doctor's bill, many a bad cold, might be entirely prevented by attention to this matter. It should be safe for the children to go anywhere in the house without danger of catching cold. If our houses were moderately heated throughout and thoroughly ventilated, how much better it would be for all concerned, than to overheat one or two rooms in the house and religiously exclude from them God's pure air.

"Immoderate use of heat during the Winter is the cause of much illness. The effect upon the general vigor of many hours daily spent in overwarm rooms is like that of heat upon a figure in wax. It droops, loses its firmness, and, little by little, will show absolute outward change. Moreover, one of the positive results of hot air is, that it paralyzes the action of the heart. Suppose you were to put your arm in a sling, and make no use of it for three months; at the end of that time, what would be its condition? It would be weak, shrunken, almost powerless; only by a system of careful exercise of weeks in duration could its original vigor be restored.

"Now, when a person indulges in too much artificial heat, this is what happens to the skin, and, through its collapse, also happens to the system at large. A person leads a sedentary life in hot rooms. As Winter deepens, the cold grows more forbidding, the fire more seductive. Fresh air is shut out, the skin becomes less and less able to resist changes of temperature. When this person does go out of doors, no matter how much clothing he may wear, he suffers; and a cold is almost sure to result."

The danger from overheating will be greatly lessened if a large pan of water is kept continually evaporating over the stove or in the air-chamber of the furnace. It is a well-known fact that, as air becomes heated, its capacity to absorb moisture is greatly increased; and this moisture, which is naturally supplied in Summer, it is necessary for us to artificially supply to the artificial Summer we create within our houses in Winter.

A safe rule would be to wear warmer clothing in Winter, and keep the temperature of the rooms we live in not higher than 68° Fahrenheit.

In all that has been said above, the requirements of ordinary country farm-houses have been kept in view, and nothing suggested which cannot be effected by a little care and forethought by the head of the household.

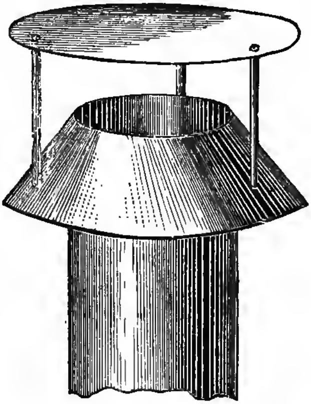
Those who can afford furnaces, or hot water, or steam, I refer to other and larger treatises, only let me add one word of advice to those having these apparatuses in use or contemplating their use, viz.: Be sure the furnace is (1) large enough not to overheat the air, in order to properly warm the house; (2) be sure there is a large supply of outdoor air to the air-chamber; (3) be sure there is an evaporating pan constantly filled in the air-chamber.

Those having the ventilation and heating of the

SCHOOL-HOUSE

and the church in charge, have a grave responsibility resting on their shoulders. To them is committed the care of others' lives and health. The school trustees should make it their duty to often visit the school-house and see that the supply of fresh air is adequate to the wants of the scholars. In the ordinary school-houses in Ewing, the air should be changed at least every nine minutes. This can be easily and safely accomplished by making in the ceiling at least three apertures one foot wide and two feet long, carried through the roof, and a foot or two above it, and fitted with an Emerson Ventilating Cowl, which is intended to prevent a back draught. These openings are to remove the foul air. The fresh air can then be supplied by any of the means mentioned above for houses. The surest way, however, would be by the use of the open stove with a fresh air inlet, as illustrated above. Whatever stove is used, it should be so placed that the children need not sit close to it, as the effect, particularly of sitting with the back to a hot stove, is very prejudicial to health, resulting often in congestion of the kidneys and other disorders.

It would be better to have two stoves, with a moderate fire in each, than one large stove overheated. Where there is a cellar beneath the building, it would be better to place these stoves in it, supplying fresh air to them by ducts, and then make as many as five openings in the floor, one foot by two, through which the warmed air will rise into the room. The cellar in this case should be used for no other purpose (some other place being provided for the coal and wood), and be kept scrupulously clean; and, where wet, made dry by drainage, as shown in the note on "Drainage for Health." Whatever method is used, the school-room should be provided with thermometers, say one in each corner, which the teacher should often consult to see that the temperature is never above 68° nor below 64°.



EMERSON VENTILATING COWL.

It should be made the duty of the janitor to see that the room is thoroughly aired, by having every window and door opened immediately after the school is closed; and this airing should continue at least an hour. It should be equally the duty of the janitor to have the room warm and all the shutters open, the sun streaming in, for an hour before school assembles.

The above remarks have been written with a special view to country district school-houses, and particularly those of Ewing township, which consist of but one room with accommodations for about fifty pupils, and an average attendance of a somewhat less number.

The editor will be glad, at any time, to furnish, free of charge, to any similar schools in New Jersey, plans and suggestions for heating and ventilating, where he is given the size of the school-room (width and depth), and height of ceiling, the average number of the pupils, and the exposure. These suggestions will be submitted to the best authorities on the subject, in order that the result desired may be obtained at the least expense and in the very best way for the particular case in point.

Let me impress on teachers that the health of the children committed to their care is of vastly greater concern than the knowledge they may be able to give them. "Ordinary attention to these matters, if systematic and constant, will do much toward lessening the 'murder of the innocents,' who so frequently are the victims of their thoughtless elders."—[*Revised by Carl Pfeiffer, Arch.*

SYNOPSIS OF SUCH LAWS OF THE STATE OF NEW JERSEY AS CONCERN A RURAL COMMUNITY.

COMPILED BY A. G. RICHEY, ESQ.

Mode of Laying out Public Roads.

When ten or more persons, being freeholders, shall think a public road necessary in any part of the county, they may apply to the Court of Common Pleas of the county for the appointment of six surveyors of the highways to lay out such road.

Ten days' notice of such application must be first given.

The surveyors of the highway are to meet, at such time and place as the court shall direct, for the purpose of laying out said road.

Notice shall be given by advertisement of the time and place of such meeting.

The surveyors of the highway, when met as aforesaid, shall view the premises, and may, if they think necessary, lay out such public road; and they shall lay the same as it appears to them to be most for the public and private convenience—having a regard to the best ground for a road and the shortest distance in such a manner as to do the least injury to private property.

And they shall make a return thereof, with a map of the same, with the courses and distances, with the time when the overseers of the highway shall open the same for public use.

The said surveyors shall also make an assessment of the damages, if any, the owner of any land (other than an applicant for such road) shall sustain by laying out the same, above the advantages that will accrue to the owner, which assessment they must affix to their return, which return, with the assessments, shall be delivered to the clerk of the Court of Common Pleas of the county, who is required to record the said return, together with the map thereof, in a book to be kept for that purpose; and every road so laid out and recorded as aforesaid shall be a lawful highway from the time appointed for opening the same.

That the clerk of any Court of Common Pleas shall not record the return of the surveyors of the highway until the expiration of fifteen days after he shall have received the same, so that any person being aggrieved thereby may, within that time, enter a caveat with the said clerk against recording the said return, which shall operate as a supersedeas to further proceedings till the next court.

At the next court, the persons who have filed the caveat, may make application to the court for the appointment of six of the chosen freeholders of the county in which the road shall have been laid out.

And the court will appoint them and designate the time and place for their meeting.

Notice of such meeting to be given.

And the chosen freeholders so appointed shall proceed to view the road so laid out.

And if they or a majority of them shall believe such laying necessary and useful, they shall certify the same to the court the term next succeeding their appointment; and the court thereupon shall cause the proceedings to be recorded; and their proceedings shall be binding and conclusive in all cases; but if they shall believe such laying out to be unnecessary and injurious, they shall certify the same to the court as aforesaid, and the proceedings of the surveyors shall then be null and void.

Law to Prevent the Spread of Canada Thistle.

If any person or persons owning or having the care of any lands, enclosed or unenclosed, in this State, shall knowingly permit any Canada thistle to grow up thereon, and suffer the same to stand until its seeds get ripe, he or they shall, for every stalk or bunch thereof so suffered to grow up, forfeit and pay a fine of twenty-five cents; to be sued for and recovered, with costs, by any person, in his name, before any court of competent jurisdiction.

The Law as to the Construction of Sidewalks.

That it shall be lawful for the inhabitants of any township in this State, at their annual meeting, to provide for the construction of sidewalks on the public highway, not exceeding in width one-fifth on each side of the road of the width thereof, and also to place posts or railings by the side thereof, which sidewalks shall be constructed out of any money raised for the repairs of highways; and the amount so to be expended, and the road or place where the sidewalks shall be made, shall be determined by such meeting or by the township committee; provided, that this provision shall not apply to any public highway, which hath been or which shall be hereafter laid out, of a less width than three rods, except in such place or places where it shall pass through a city, town, or village.

And it shall be lawful for any person owning or occupying lands adjoining a public road or highway in any township, city, or ward, to construct sidewalks on said highway in the manner hereinbefore provided, contiguous and along the line of said land.

That when a sidewalk shall have been constructed as aforesaid, every person who shall ride or drive a horse or team thereon, except for the purpose of crossing the same, when necessary so to do, shall forfeit and pay the sum of five dollars to the use of the township, to be sued for and recovered by any person who shall sue for the same.

SUPPLEMENT TO THE FOREGOING ACT.

That the provisions of the act to which this is a supplement, shall not authorize the construction of sidewalks of a greater width than five feet on each side of any public road or highway in this State, which hath been or which shall hereafter be laid out of a less width than three rods, except in such place or places where they pass through the cities, towns, or villages of this State.

As to Working and Maintaining Public Roads.

The township committee who shall be hereafter chosen agreeably to law, in the respective townships of this State, or a majority of such committee, are hereby authorized and directed to assign and appoint, in writing, to the overseers of the highways, respectively, their several limits and divisions of the highways within such township, for opening, clearing out, working, amendment and repair, and the said overseers are hereby commanded to observe and conform themselves to such assignment.

That it shall be the duty of the said overseers to hire laborers, and also horses, oxen, wagons, ploughs, carts and other implements to open, clear out, make, work, amend, repair and keep in good order the highways within their respective limits and divisions, to make causeways, and to erect such bridges as can be built by common laborers, and to procure whatever materials they shall deem necessary to effect the purposes specified in this section.

That the moneys necessary for defraying the costs, charges and expenses of opening, clearing out, making, working, amending, repairing and keeping in good order the highways, and procuring materials for the same, and also the compensation allowed for the services of the overseers thereof, shall be granted, assessed, collected and raised in the manner prescribed by the act entitled "An act incorporating the inhabitants of townships, designating their powers and regulating their meetings"; and it is hereby enjoined upon the said townships, that they be careful to have money in hand ready to advance sufficient for the objects and purposes specified in this act.

Law as to Cutting Down Trees Along Highways.

That no overseer of the highways or other person, except the owner or owners thereof, shall cut down, willfully injure, or destroy any fruit, shade or ornamental tree which may have been or which shall be planted or set out by the owner or possessor of lands adjoining any highway in this State, and which shall not extend more than seven feet out from the line of the road towards the center of the same, unless the township committee of the township in which such road is situate, or a majority of such committee, shall first order the cutting down or destroying of the same.

That if any overseer of the highway or other person shall offend against the provisions of the preceding section, he, she or they so offending shall forfeit and pay the sum of fifty dollars for each and every such offence, to be recovered in an action of debt, with costs of suit, in any court having cognizance thereof, by any person who may prosecute for the same, within six months after such offence shall have been committed, provided that this act shall not prevent any overseer from clearing out any highways to their full width where they pass through any wood or forest.

Law Against Girdling Trees Along Highways.

That no tree shall be girdled or killed on the highways, under the penalty of two dollars, to be recovered by action of debt, with costs, by the overseer of the highways, in any court of record having cognizance of that sum, and applied to the working and repair of the highways; and if any such tree shall be girdled or killed in the manner aforesaid, it shall be the duty of the said overseer forthwith to cut down such tree so girdled or killed.

That if any person shall girdle or kill any tree standing within two rods of such highway, the owner or possessor of the land where the same stands shall, within two years after such girdling or killing, cut down the said tree; or, on failure thereof, shall forfeit and pay two dollars, to be recovered and applied in the manner above set forth.

The Law as to Wheel Carriages.

That all wagons and other wheel carriages of any kind or description whatever, drawn by one or more horse or horses, oxen, or other cattle, made and constructed, and all axle-trees made or repaired from and after the first day of October, A.D. 1874, traveling or passing on or through the roads or highways within this State, belonging to persons resident therein, shall run or track on the ground, from center to center of the felloes, not less than four feet and ten inches, under the penalty of five dollars, to be recovered from the owner or owners, proprietor or proprietors of such wagon or other wheel carriage, for each and every offence, before any one justice of the peace of this State, where the fact shall be committed, upon the oath or affirmation of one or more witness or witnesses. Which said fine, when recovered, shall be paid, one moiety thereof to the overseers of the highways for the township, division, or precinct where the fact was committed, to be applied toward the repair of the highways within the same; and the other moiety to be paid to the person or persons prosecuting the same to effect; and the said overseers are hereby made accountable for all moneys they may receive in virtue of this act, in the same manner and form as they are for other fines and forfeitures; provided, always, that the above fines shall not be set or levied more than once upon one journey, and that every information relative to any breach of this act be made within twenty days after the offence is committed.

Respecting Railroads and Canals.

Every incorporated company that hath been or hereafter may be authorized to construct any railroad in this State, shall cause to be placed on some part of every locomotive engine used by any such company, a bell of a weight of not less than thirty pounds, or steam whistle which can be heard distinctly at a distance of at least three hundred yards from the place where any such railroad crosses a turnpike road or highway upon the same level with the said railroad, and such bell shall be kept ringing, or such whistle shall continue to be blown, until the engine has crossed such turnpike or highway, or has stopped.

And any railroad company which shall construct any railroad by virtue of powers granted in their charter by this State, may, in crossing any public highway, for the purpose of making such highway cross over or under such railroad at an easy and suitable grade, alter the location of such highway at their own expense, so far as shall be necessary to make such highway pass over or under said railroad at such grade, and such alteration shall be valid and of the same effect as if made by surveyors of the highway according to law. And all alterations heretofore made in any public highway in this State, by any such railroad company, for the purpose and in the manner aforesaid, are hereby confirmed and made valid as if the same had been made by the surveyors of the highway according to law.

If any person shall be injured by a locomotive engine, car or cars while walking, standing or playing on any railroad in this State, or by jumping on or off a car while in motion, such person shall be deemed to have contributed to the injury sustained, and shall not recover any damages therefor from the company owning or operating the said railroad; provided, however, that this section shall not apply to any person or persons crossing a railroad at any lawful public or private crossing.

Every railroad company shall cause a board with this inscription, "Look out for the locomotive," to be erected and maintained wherever the road of such company may be crossed by any turnpike road or public highway, so as to be easily seen by travelers.

If any such company shall refuse or neglect to comply with the foregoing provisions, they shall forfeit for every such refusal or neglect, the sum of one hundred dollars, to be sued for by the clerk of any township in which such refusal or neglect shall occur, for the use of said township, and to be recovered, with costs, in action of debt in any court having cognizance thereof; provided, that all complaints of any refusal or neglect to comply with said provisions shall have been made within ten days thereafter; and, provided further, that nothing herein contained shall be construed to take away from any individual or individuals any right he, she or they may have to recover damages for any injury which may be incurred by any refusal or neglect to comply with the requirements of this act.

If any person shall willfully obliterate, destroy or injure any such board so as aforesaid erected, he, she or they so offending shall forfeit for every such offence the sum of twenty dollars, to be recovered, with costs, by any such railroad company, in an action of debt before any court having cognizance thereof, for the use of said company.

The Law as to the Width of Public Roads.

That every public road or highway which shall be hereafter laid out shall not be more than four rods wide, unless a greater width shall be specified in the notices and applications for the same; nor shall any such road be less than two rods wide, unless the same be laid out in a village, borough or city, and where, by reason of buildings or other permanent erections, such road cannot be, conveniently, laid out of such width.

That every private road which shall be hereafter laid out shall not be more than thirty feet in width, but may be less, at the discretion of the surveyors.

The Law to Prevent the Defacement of Natural Scenery.

That without the previous consent of the owner, all persons are hereafter prohibited from advertising their wares or occupation, by printed notices of the same, on fences or other private property, or upon cliffs or rocks or other natural objects.

And all persons violating the provisions of the above paragraph shall be punished by a fine of ten dollars for each offence, to be recovered before a justice of the peace; the action to be brought in debt, in the corporate name of the township, borough or city in which such offence shall be committed; one-half of which said fine shall be for the use of the informer or prosecutor of such action, the other half to the overseer of the poor of the township, borough or city in which such offence shall have been committed.

Malicious Mischief.

Whosoever shall unlawfully and maliciously pull, or throw down, or in anywise destroy any bridge, whether over any stream of water or otherwise, under which bridge any highway, railway or canal shall pass, or do any injury with intent, and so as thereby to render such bridge, viaduct, or the highway, railway or canal passing over or under the same, or any part thereof, dangerous or impassable, shall be guilty of a misdemeanor, and shall be liable to imprisonment at hard labor, not over one year, or fine, not over two hundred dollars, or both.

As to Certain Crimes.

Whoever shall unlawfully and maliciously destroy or damage any statue, bust or vase, or any other article or thing kept for the purpose of art, science or literature, or as an object of curiosity in any museum, gallery, cabinet, library or other repository, which museum, gallery, cabinet, library or other repository is open for the admission of the public, or of any considerable number of persons, to view the same, either by permission of the proprietor thereof, or by the payment of money before entering the same; or any picture, statue, monument, or other memorial of the dead, or other ornament in any church or other place of divine worship, or in any building, or in any churchyard, burial ground, or public garden or ground, or any ornament, railing or fence surrounding such statue or monument, shall be guilty of a misdemeanor, and, being convicted thereof, shall be liable to be imprisoned for any term not exceeding six months, or fined two hundred dollars.

Whosoever shall steal or cut, break, root up, or otherwise destroy or damage, with intent to steal, the whole or any part of any tree, sapling or shrub, or any underwood or plant, root, fruit or vegetable production, wheresoever the same may be growing, or shall steal, or shall cut, break or throw down, with intent to steal, any fence or any wooden post, pale, wire or rail set up or used as a fence, or any stile or gate, or any part thereof, respectively, he shall be guilty of a misdemeanor, and, on conviction thereof, shall be liable to be punished as in case of larceny.

As to Disorderly Persons.

Any person who shall enter the buildings or go upon the lands belonging to any public school district of this State, or used and occupied for school purposes, by any public school in this State, and shall break, injure or deface such building, or any part thereof, or the fences or out-houses belonging to or connected with such building or lands, or shall disturb the exercises of such public school, or molest or give annoyance to the children attending such school, or any teacher therein, shall be deemed and adjudged to be a disorderly person, and may be apprehended in the manner hereinafter described in this act, and taken before any justice of the peace of the county where such person may be apprehended. And it shall be the duty of the said justice to commit such disorderly person, when convicted before him by the confession of the offender or by the oath or affirmation of one or more witnesses, to the county jail of such county, there to be kept at hard labor for any term not exceeding thirty days.

An Act to Define and Suppress Tramps.

That the following described persons are hereby declared to be tramps: All persons who shall come from any place without this State, or from any city, county, township, borough or place in this State, and have no legal settlement in the places in which they are found, and live idly and without employment, and refuse to work for the usual and common wages given to other persons for like work in the place where they then are, or shall be found going about from door to door, or placing themselves in the streets, highways or roads to beg or gather alms, and can give no reasonable account of themselves or their business in such places.

That if any person shall be found offending in any county, city, township, borough or district in this State, against this act, it shall and may be lawful for any constable or police officer of such place, and he is hereby enjoined and required, on notice thereof to him given by any of the inhabitants thereof, or without such notice, on his own view, to apprehend and convey, or cause to be conveyed, such person to a justice of the peace or other magistrate of such place, who shall examine such person, and shall commit him or her, being thereof legally convicted before him, on his own view, or by the confession of such offenders, or by the oath or affirmation of one or more credible witnesses, to labor upon any county farm or upon the streets, roads and highways of any city, township or borough, or in any house of correction, poor-house, work-house or common jail, for a term not exceeding six months, and shall forthwith commit him or her to the custody of the steward, keeper or superintendent of such county farm, house of correction, poor-house, work-house or common jail, or to the supervisors or overseers of the highways, street commissioners, or other officer or officers having in charge the repairs of any street, road or highway, or overseers of the poor of the respective township, borough, county or city wherein such person shall be found, as in their judgment shall be deemed most expedient.

An Act to Prevent Trespassing with Guns.

If any person or persons shall carry any gun on any land not his own, and for which the owner pays taxes, or is in his lawful possession, unless he hath license or permission in writing from the owner or owners or legal possessor, every such person so offending, and convicted thereof, either upon the view of any justice of the peace within this State, or by the oath or affirmation of one or more witnesses, before any justice of the peace within this State, or by the oath or affirmation of one or more witnesses, before any justice of the peace of either of the counties, cities or towns corporate, of this State, in which the offender may be taken or reside, he shall, for every such offence, forfeit and pay to the owner of the soil, or his tenant in possession, the sum of five dollars, with costs of suit; which forfeiture may and shall be sued for and recovered by the owner of the soil or tenant in possession, before any justice of the peace in this State, for the use of such owner or tenant in possession.

Law to Prevent the Adulteration of Milk.

If any person shall knowingly sell any impure or unwholesome milk, he shall be deemed guilty of a misdemeanor, and on conviction thereof, he shall be punished by a fine of not less than fifty dollars for each and every offence.

And if any person shall adulterate milk with a view of offering the same for sale, he shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than fifty dollars for each and every offence.

The addition of water to milk is hereby declared to be an adulteration thereof.

Law for the Prevention of Cruelty to Animals.

That any person who shall overdrive, overload, overwork, cruelly beat or otherwise abuse any living animal, and any person having the charge of any living animal, who inflicts unnecessary cruelty upon the same, or fails to provide the same with proper food, drink or shelter, or protection from the weather, shall be deemed guilty of a misdemeanor, and for every such offence, shall, on conviction thereof, be punished, by fine not exceeding two hundred dollars, or by imprisonment in the county jail not exceeding six months, or both, in the discretion of the court.

And any person who shall keep or use any place for the purpose of fighting or baiting any bull, bear, dog, cock, or other living animal or creature, and every person who shall be present and witness, encourage, aid or assist therein, shall be deemed guilty of a misdemeanor, and for every such offence, shall, on conviction thereof, be punished by fine not exceeding one thousand dollars, or by imprisonment at hard labor not exceeding two years, or both, at the discretion of the court.

And any person who shall use any dog or dogs for the purpose of drawing any cart or other vehicle for business or other purposes, shall forfeit and pay a fine of one dollar for the first offence and ten dollars for each subsequent offence—such offender, together with the dog, cart or other vehicle shall be taken before a justice of the peace or police magistrate, who, upon being satisfied, shall impose said fine, which said fine, as soon as imposed, shall have the force and effect of a judgment, and execution may be immediately issued thereon, and the articles so seized levied upon and sold to pay and satisfy the said fine, together with the costs.

That if a maimed, sick, infirm or disabled animal shall be abandoned to die, by any person, in any public place, such person shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished as provided for in the beginning of this article. That any person who shall overdrive, overwork, torture, deprive of necessary sustenance, or cruelly beat or otherwise abuse or kill, any living animal or creature, and every person who shall be present, and witness, encourage or assist therein, shall forfeit and pay such sum, not exceeding one hundred dollars, as the court shall determine, to be sued for and recovered in an action of debt, with costs of suit, by any person, in the name of "The New Jersey Society for the Prevention of Cruelty to Animals."

An Act for the Preservation of Sheep.

When any person shall sustain damage or injury by reason of his or her sheep or lambs being killed or wounded by a dog or dogs, wolf or wolves, it shall be lawful for such person to take two respectable freeholders of the township wherein such damage was done, who are in nowise akin to the party so calling them, to view the sheep or lambs so killed or wounded, and if it shall appear to their satisfaction that the said sheep or lambs were killed or wounded by a dog or dogs, wolf or wolves, then the said freeholders shall make a return or certificate thereof in writing, stating the amount of damages such person may have sustained, which shall in no case exceed five dollars for one sheep or lamb so killed or wounded, which said certificate shall entitle the person so injured to the sum stated therein as the damage sustained, to be paid by the township committee, in conformity to the provisions made therefor in the fifth section of this act. And in case the damage so certified shall appear to the town committee to be excessive, it shall and may be lawful for said committee to require the facts stated and the claim exhibited, to be investigated before them on oath or affirmation, and shall award payment accordingly. Provided always, that nothing herein contained shall extend to cases wherein a recovery of damages can be obtained of the owner or owners of such dog or dogs as shall have committed the injury.

Protection Against Mad Dogs.

The mayor of any incorporated town in this State, by the advice and consent of the common council of the town, and the township clerk of any township in this State, by the advice of the township committee, are authorized, whenever, in their opinion, the public safety may require, to issue his proclamation authorizing the destruction of all dogs, male and female, found running at large within the limits of the town, except such as shall be properly muzzled with a wire muzzle about the nose, securely fastened, after one day's public notice by written or printed hand-bills; provided, that nothing in said proclamation shall apply to a dog or dogs of a non-resident passing through the town accompanied by the owner or owners of such dog or dogs.

An Act to Prevent Spread of Contagious Diseases Amongst Cattle.

The town committee of each township of this State, upon notice of the existence of any disease among cattle in their township, are authorized personally to examine the cases, and if the symptoms which characterize contagious diseases are exhibited, they shall cause such sick animals to be immediately removed and kept separate from all other cattle; and the remaining cattle of said owner shall be kept isolated from the sick ones, and both they and the sick animals shall be kept distant at least four hundred feet from the public road, and the same distance from the premises of all neighbors.

The town committee are also authorized to prohibit the importation of cattle from other places into or through their respective township; and if any one shall import or drive any cattle into or through any township after the same shall have been publicly prohibited by the town committee, he shall pay a fine of one hundred dollars for every bull, ox, steer, cow, heifer or calf so driven into a township. Any person who shall dispose of any cattle or stock, knowing it to be subject to any contagious disease, shall pay a fine of one hundred dollars for any such animal sold within the township.

The persons qualified to vote at town meetings are authorized at their annual meetings to make such provision and allow such rewards for the destruction of wolves, wild-cats, foxes, crows, black-birds, and other noxious wild animals and birds, as they so assembled shall deem necessary or proper.

Destruction of Insectiverous, Small and Harmless Birds.

That it shall not be lawful for any person to wantonly shoot, entrap for the purpose of killing, or in any other manner destroy any upland birds whose principal food is insects, comprised in the families of swallows, fly-catchers, finches, larks, wood-peckers and other species and varieties of land birds of every description regarded as harmless in their habits, and whose flesh is unfit for food, excepting the eagle, raven, crow, all hawks and owls which prey upon other birds, and that it shall not be lawful for any person to take or destroy the eggs or young of any of the species of birds which are intended to be protected by this act.

And if complaint is made, under oath, before any justice of the peace of this State, of any violation of the foregoing provisions, it shall be the duty of such justice to forthwith issue, under his hand and seal, a warrant against the person or persons so offending, and the proceedings before the justice shall be regulated according to the provisions of the act entitled "An act constituting courts for the trial of small causes."

And every person offending against the provisions of this act, shall, on conviction, be fined in any sum not less than ten or more than twenty dollars, with costs of suit, in the discretion of the court before whom such conviction shall be had.

As the school law is published in full in pamphlet form, it has not been thought worth while to make any extracts therefrom; but the editor would call attention to that provision of the law which authorizes the State Superintendent to pay to any school, which shall raise twenty dollars by subscription for a library or for philosophical apparatus, a like sum to be used for the same purpose. Furthermore, so long, after the first year, as a school raises ten dollars a year for the above purpose, the State will add a like sum.

CONSTITUTION

OF THE

WEST EWING IMPROVEMENT ASSOCIATION.

We, the residents of the township of Ewing, county of Mercer and State of New Jersey, in order to form an Association to improve and ornament the public roads and grounds, do ordain and establish this Constitution for said Association.

ARTICLE I.

This Association shall be called "THE WEST EWING IMPROVEMENT ASSOCIATION."

ARTICLE II.

The object of this Association shall be to improve and ornament the public roads and grounds of the township, by planting and cultivating trees, establishing and maintaining walks, grading and draining the roadways, providing public drinking troughs, breaking out paths through the snow, lighting canal bridges, and generally doing whatever may tend to the improvement of the township as a place of residence.

ARTICLE III.

The officers of this Association shall be a President, two Vice-Presidents, a Secretary and a Treasurer, who shall constitute the Executive Committee.

The officers shall be elected at the annual meeting, (except for the first election, which shall take place October 8th, 1878,) and shall hold their offices until their successors have been elected.

ARTICLE IV.

It shall be the duty of the President, and, in his absence, of the senior Vice-President, to preside at all meetings of the

Association, and to carry out all orders of the Executive Committee.

ARTICLE V.

It shall be the duty of the Secretary to keep a correct and careful record of all proceedings of the Association and of the Executive Committee, in a book suitable for their preservation; to give notice of all meetings of the Association and of the Executive Committee; to make all publications, and to give all public and private notices ordered by the Executive Committee, and to attend to all correspondence of the Association.

ARTICLE VI.

It shall be the duty of the Treasurer to keep the funds of the Association, and to make such disbursements as may be ordered by the Executive Committee.

ARTICLE VII.

It shall be the duty of the Executive Committee to employ all laborers, make all contracts, expend all moneys, and generally to direct and superintend all improvements which, in their discretion, and with the means at their command, will best serve the public interest.

The Executive Committee shall hold a meeting at least once a month, and as much oftener as they may deem expedient.

The Executive Committee shall have power to institute premiums to be awarded for planting and protecting ornamental trees, and for doing such other acts as may seem to them worthy of such encouragement. They shall also encourage frequent public meetings of the Association, and of citizens generally, both with a view to maintain an interest in their work, and for the general encouragement of meeting together for discussion and amusement.

It shall be the duty of the Executive Committee to obtain the preparation of papers on topics directly bearing on the work of the Association, which shall be read at the social meetings.

ARTICLE VIII.

Auxiliary to the Executive Committee there shall be subcommittees of an advisory nature, whose duty it shall be to promote the objects of the Association in their district, by interesting all members of the community in the work, and suggesting improvements most needed in their immediate neighborhoods.

These committees shall be especially charged with preserving and carefully providing for the safety of trees planted, and other improvements effected in their districts. They shall be composed of two ladies and one gentleman, and shall offer their suggestions at the social meetings.

These committees shall be appointed by the President of the Association.

ARTICLE IX.

Three members of the Executive Committee, present at any meeting, shall constitute a quorum for transacting business, and a vote of the majority of those present shall be binding on the Association.

ARTICLE X.

No debt shall be contracted by the Executive Committee beyond the amount of available funds within their control to pay it; and no member of the Association shall be liable for any debt of the Association beyond the amount of his or her subscription.

ARTICLE XI.

Every person over fourteen years of age, who shall plant a tree under the direction of the Executive Committee, and obligate himself or herself to protect it for three years, or who shall pay the sum of one dollar annually, shall be a member of this Association, and every child under fourteen years of age, who shall pay the sum of twenty-five cents annually, shall be a member of this Association.

ARTICLE XII.

The payment of ten dollars annually for three years, or twenty-five dollars in one sum, shall constitute a person a member of this Association for life.

ARTICLE XIII.

The autograph signatures of all members of the Association shall be preserved in a book suitable for that purpose.

ARTICLE XIV.

An annual meeting of the Association shall be held at such a place as the Executive Committee may direct, on the fourth Wednesday of August, at two o'clock P.M. Notice of such meeting shall be posted at the five most public places in the district, at least seven days prior to the time of holding said meeting, and a written notice shall be sent to all non-resident members. Other meetings of the Association may be called by the Executive Committee, on due notice being given.

ARTICLE XV.

At the annual meeting, the Executive Committee shall report the amount of money received during the year, and the source from which it has been received; the amount of money expended during the year, and the objects for which it has been expended; the number of trees planted at the cost of the Association; the number planted by individuals, with the location, the kind of tree and the name of the planter, and generally all of the acts of the committee. This report shall be entered on the record of the Association.

ARTICLE XVI.

Any person who shall plant a tree under the direction of the Executive Committee, and shall protect it for five years, shall be entitled to have such tree known forever by his or her name.

ARTICLE XVII.

This Constitution may be amended by the Executive Committee, with the approval of the majority of the members present, at any annual meeting of the Association, or at any special meeting, the notice of which shall have been accompanied by a copy of the proposed amendment, with the statement that the amendment is to be voted on at such meeting.

BY-LAWS.

I. The Executive Committee shall grant a certificate of merit, of an artistic design, to such of the school children as shall be certified by their teachers to have shown special zeal in keeping the surroundings of the school-houses neat and clean, or in beautifying them in any way. These certificates to be presented by the President—the committee, or some of them, being present—on the first Wednesday in June, at the morning session for Scudder's Falls, and afternoon session for Birmingham and Brookville.

II. RULES FOR TREE PLANTING.

1. Trees shall be planted on the road side of the line, and at a distance of four feet therefrom, except in the case of roads two rods wide and under, when the permission of the property-holder shall be obtained, to set them one foot from the line, in the field.

2. The trees shall be set apart a distance of 150 feet, the opposite rows alternating.

3. The following trees are recommended as best for road planting, viz.: Sugar Maple, Norway Maple, Elm, White Ash, Linden, Horse Chestnut, Water Birch, Mountain Ash, and occasionally a fruit tree.

III. The members of this Association shall, as a body and as individuals, use their influence to prevent the erection of advertising placards of any description, and to this end mutually agree to remove or cause to be removed, within ten days from June 1st, 1879, any such signs on the property of any of them, whether painted on barns, fences or stones, or nailed or pasted on trees or fences, or otherwise constructed, except legal notices and the usual advertisements of church festivals, which latter shall be allowed to stand for ten days before the date of the festival.

IV. Hereafter any person, upon compliance with Article XI of the Constitution, may be elected a member of this Association, on the nomination of any member whose dues are paid, and a vote of two-thirds of the members whose dues are paid.

V. No charge shall be made for the patent road-scraper for private use, by members of the Association. To all others, and for work on the public roads, the charge shall be five dollars per day, the Association furnishing a man to work the machine (whom the Executive Committee shall pay a sum not to exceed one dollar and a quarter), but no team. In all cases the consent of the Executive Committee must first be obtained.

LIST OF BOOKS

Which will be found valuable to those interested in Rural and Sanitary Improvement Associations.

Air and Its Relations to Life, by W. N. Hartley. $1.50.

A Pictorial Guide to Domestic Sanitary Defects, by T. Pridgin Teale, M.A., Surgeon to the General Infirmary at Leeds. With 55 lithographs. 8vo. $4.

A Treatise on Ventilation, by Lewis W. Leeds. $2.50.

Drainage for Profit and Draining for Health, by George E. Waring, Jr. $1.50.

Frankland's Water Analysis for Sanitary Purposes. $1.

Hassell's Food and Its Adulterations.

Health and Comfort in House Building, by J. Drysdale, M.D., and J. W. Hayward, M.D. Second Edition. $3.

Healthy Houses, by Wm. Eassie. $1.

Healthy Houses, by Fleming Jenkin, F.R.S., adapted to American Conditions by George E. Waring, Jr. Harpers' Half-Hour Series. 25 cents.

Heat, as applied to the Useful Arts, for the Use of Engineers, Architects, etc., by Thomas Box. $5.

House Drainage and Water Service, by James C. Bayles. $3.

Lecture on Water Supply, Sewage and Sewage Utilization, by W. H. Corfield, M.A. 50 cents.

Parkes' Hygiene, edited by De Chaumont. $6.

Sanitary Engineering, by Baldwin Latham.

Sanitary Engineering, by J. Bailey Denton.

Sanitary Work in Towns and Villages, by Charles Slagg.

The House and Its Surroundings. 40 cents.

The Sanitary Drainage of Houses and Towns, by George E. Waring, Jr. $2.

Villages and Village Life, by Rev. N. H. Eggleston. $1.75.

Village Improvements and Farm Villages, by Col. George E. Waring, Jr. 75 cents.

Wanklyn and Chapman's Water Analysis. $2.50.

Wilson's Hand-Book of Hygiene. $3.

Any of the above books may be obtained at the office of THE SANITARY ENGINEER, 140 William Street, New York. P. O. Box 3037.

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[From the Report of the Secretary of Conn. Board of Agriculture, 1881.]

WHAT SHOULD OUR SCHOOLS DO FOR AGRICULTURE?

BY PROF. B. G. NORTHROP.

FARMING is the leading and most essential business of the country, occupying more than three-fourths of our laboring population. It is the basis of the wealth, prosperity, and power of the American people. Its depreciation would demoralize the nation. It was the original, divinely-appointed calling of man. God planted a garden in Eden, and made it man's first duty to "dress and keep it." When driven from Eden, it was still his mission to "till the ground from whence he was taken, and to eat bread in the sweat of his face." The Creator plainly intended that Agriculture should be the ground-work of civilized society; the basis of all progress. On its prosperity hang the hopes of the race, far more than on any other calling. It must provide the means of sustaining an increasing population, or there can be no growth. Commerce and manufactures depend upon it more than it does upon them. In the words of Webster, "they all stand together like pillars in a cluster, the largest in the center, and that largest is Agriculture." For an interest so broad and vital to the prosperity of the whole country, our schools should accomplish the best possible results.

Now that slavery is abolished, we have no vestige of a caste system in America. Labor is honorable, and the laborer is honored. The most popular rallying-cry to help a candidate for the highest office is some term which affiliates him with farmers or other workmen, like "the rail-splitter," or "tow-path boy." In contrast with the distinct classes and hereditary nobilities of the old world, it is our proud national characteristic that we are a working people, that he is the noblest who works most and best for the general weal, and that the cause of the workmen is recognized as the cause of all. The best way to elevate farming is to elevate the farmer. The people are learning that mere muscle is weak, and that brains help the hands in all work, that knowledge and skill multiply the value and productive power of muscular efforts. Whatever the chemical analyses of our Experiment Station may show, the best of all fertilizers isbrains. In farming, as every where, if knowledge is power, ignorance is impotence. What a man *is*, stamps an impress upon what he does, on the farm or in the shop. The style of the work depends on the character of the workman. Whatever elevates the farmer ultimately improves his farming. Whatever degrades the farmer at once depreciates his work. The wealth and welfare of individuals and communities, always dependent on labor, can be most fully secured only by educated labor. You can dignify farming in no way so surely as by educating, and thus elevating, the farmer. As mind triumphs over matter, the amount of manual labor requisite to secure equal results constantly lessens. The future improvement of farming depends on brain as well as brawn. The progress of civilization has always been commensurate with man's dominion over nature, and his utilization of her forces and resources. "Subdue the earth and have dominion over it," was the primeval command. We gain that dominion over nature just in proportion as we *discover* and obey her laws. In struggles for material success, he wins who best wields physical forces.

To enable our schools to accomplish better results for agriculture, I invite our farmers to do more for the schools, and especially to visit them. We need a still higher appreciation of them, and a more active and intelligent interest in their improvement. Apathy on the part of parents would neutralize the efforts of the best teachers. The character of the schools in every place must answer to the local public sentiment. You stimulate public interest by improving the schools, no more surely than you improve the schools by elevating public opinion. The Legislature alone cannot create good schools. Right laws may accomplish much, but the people, once in earnest, will do more. In our rural districts, no class can so effectually advance this great interest of the people as the farmers.

The most essential service our public schools can render for Agriculture is to give all our youth a thorough training in the common English branches. These lay the foundation for success in all after work, whether on the farm, in the shop or store. The point of greatest weakness, even in our colleges, is found in the deficiency of their candidates in the elementary branches. Thoroughness here at the outset means thoroughness everywhere. The habits of accuracy, of application, of self-control, and self-reliance in overcoming difficulties, early formed in school, constitute the best preparation for the farm and all other callings of life. Far more thought and time and drill should be given to these simple elements. Rightly taught, they provide the truest discipline for the juvenile mind, and form the best basis for all future acquisitions. When we build the superstructure without a firm foundation, all is insecure. The first effort of the school is to lay the ground-work broad and strong. That done, and you create the desire and the skill to build up the edifice; that done, and school is a welcome place, and study becomes a pleasure; that done, and there follows such a hungering for knowledge that when one's school-days are ended he realizes that his education is but just begun, and for the rest, it shall be the aim and pleasure of his life to educate himself. Even though the milking may summon him early in the morning, and the chores detain him late at night, he will seek time and find time for the cherished work of self-improvement. Place him where you will, let his work press as it may, he will find leisure for reading, and occupy rainy days, the long winter evenings, and all intervals of labor in efforts for self-improvement. Even the odd moments thus utilized, in the end yield a large reward. The habit of utilizing these odd moments, and thus learning how to economize time as well as money, has most important moral bearings. The boy who thus early learns that "life is real, life is earnest," and makes the most of each passing hour, is gaining self-command and self-respect, high aims and purposes that lift him above temptation and give him the true farmer's self-poise and conscious independence.

To secure the best results for our farmers, I would advocate giving greater prominence to *reading*, which I have long regarded as by far the most important study taught in our schools. This is the surest way to the mastery of all higher studies. Early proficiency here fosters a fondness for books, while aversion to study springs from tasking youth in severer branches before they can read fluently. Let a child early learn to read with facility, and he has the key by which he can open any door in the temple of science. Isolated as the farmer's homes necessarily are, to a great extent, reading should be made the never-failing attraction of the long winter evenings. But when it is a toilsome process to spell out the words, there can be little pleasure in reading or interest in the narrative. It is the duty or rather the privilege of the farmer to see to it that his children are liberally supplied with attractive and wholesome reading, whether by the purchase or exchange of books, or by reading clubs, or by a town or district library. Whenever its importance is duly felt, some method of gaining the proper supply will be devised.

For the best results to our farmers, and to all industrial classes, less time should be given to the complex puzzles of arithmetic, and more to the simple ground rules. Master addition, subtraction, multiplication, division, percentage, and the keeping of accounts, and the rest which is of practical value is easily and quickly gained. Our arithmetics are too voluminous. Let there be more drill in rapid mental combinations and practical methods and principles, and less study of abstruse processes. Such topics as alligation, medial and alternate, and commutation of radix, and others as intricate and useless, may well be omitted in a common-school course. These and kindred topics, never applied in ordinary business, fill a large space in the arithmetics, and waste much precious time of the pupils. They have the sanction of tradition rather than of common-sense. In continuing them, teachers and authors have consulted usage more than utility. Like the titled scions of rank in the old world, they have come down by so long a literary descent that no one disputes their right to their honored place. Worth more than all these obsolete processes is the thorough mastery of the ground rules. Rapid mental combinations should be daily practiced, till pupils can add, multiply, and divide with the utmost rapidity and accuracy. The art of arithmetic will thus be mastered, though the profundities of the science be not explored. Ex-President Thomas Hill, of Harvard college, himself an eminent mathematician, strongly condemns the common practice of stupefying and disgusting pupils with premature attempts to understand arithmetic as a science, while, as a consequence, they fail to acquire facility in it as an art. Life is not long enough to spend so much time on the intricacies of compound proportion, permutation, and the like, that not one in a thousand ever applies in business.

The public school should train our youth in habits of *observation*, which is the prime secret of success in farming, and forms the true basis of all higher education. The child's intellectual life begins with impressions from the senses, which are the windows of the soul. The noblest of these, and the royal avenue to the mind, is the eye. This sense-education commences in the cradle, and should continue through life. Hence, "Things before names, ideas before words," and, in higher stages, "Principles and processes before rules," should be the motto. Too often the teacher begins with books and continues with books only, teaching that which is impractical, if not incomprehensible, to the neglect of things nearest at hand, things most interesting, suggestive, and useful. God designed nature to be the earliest and most constant teacher of the juvenile mind, and has made objects and events the leading instruments of developing the faculties. Invaluable as are books, they are but the art of man, while nature is the art of God. It is therefore a narrow view of education that makes books its only instruments. Every device should be employed to foster love of nature, and form habits of careful observation of common things. The organs of sense, when not early trained, become rigid and unimpressible. The teacher who relies upon the text-book alone is more than three thousand years behind Job, whose maxims deserve a place in the most modern didactics. "Ask now the beasts, and they shall teach thee, and the fowls of the air, and they shall tell thee; or speak to the earth, and it shall teach thee; and the fishes of the sea shall declare unto thee." Such a teacher forgets the motto of the wise man, who said, "Go to the ant, thou sluggard; consider her ways and be wise," or that of the Great Teacher, who said, "Consider the lilies of the field, how they grow," and "Behold the fowls of the air." Milton well says, "To know those things which about us lie in daily life is the prime wisdom."

I commend to our farmers' boys the advice given to youth by Hugh Miller: "Learn to make a right use of your *eyes;* the commonest things are worth looking at, even stones, weeds, and the most familiar animals. One of the best schools I ever attended was the miscellany of objects and circumstances surrounding me in my native district, challenging the first exercise of my senses and fancy, and this is a species of education open to all." True, but how few are open to it. How many go through the world practically blindfolded. Under the lead of his uncle Sandy, the keen-eyed harness-maker, Hugh Miller, while a boy, had observed carefully the rocks, rains, tides, trees, ferns, shell-fish, sea-fowl, and insects along the rocky shore of his native Chromarty. While working seventeen years as stone-mason in the quarries or sheds, he studied the stones he was hammering, and thus became the most eminent geologist of his age. So, in general, the most distinguished men of all ages and countries have been close students of nature and observers of common things.

I have emphasized this subject because the careful observation of nature's processes is specially essential to the success of the farmer. Unless acquired early, the habit is not likely to be ever formed. This work cannot be done by proxy. The judgment of the farmer must be based on his personal observations. Indispensable as is the knowledge gained from books, its use and application depends on one's own study of things. The failures of fancy farmers come from following book theories without that adaptation to changed local conditions which personal observation and experience alone can suggest. Hence, both in the family and school, curiosity should be so stimulated as to prompt an insatiable desire for that knowledge which comes through the senses when trained in observing the qualities of common things. Curiosity, or, what is kindred, love of knowledge, is one of the strongest natural desires of the child. Though too often dwarfed by our blundering, when the senses are sharpened it is one of the most vital forces in education, becoming the parent of perception and attention, of memory, imagination, and expression. It prepares the soil and fertilizes the seeds of truth. A farmer might as well sow a field without plowing as a teacher instruct pupils in whose minds no love of knowledge has been awakened. Strong in childhood, it should grow with years and attainments. Though at first a restless instinct, it should mature into a ruling passion. Curiosity is to the mind what appetite is to the body. It creates a hungering for knowledge, which is the mind's food. Love of truth was as strong a passion with Newton or Agassiz as love of conquest with Napoleon. Under its healthful inspiration, study is a pleasure,—without it, a task; the dullest drudgery, "a weariness of the flesh." Curiosity is the primal desire to which the child's nature responds; it is the impelling power to which genius, when enriched with the treasures of science, is most susceptible. The amplest supplies only add fuel to the flame. Instead of surfeit, there comes an intenser craving for more. Each new attainment gives strength and stimulus for higher acquisitions. To show how susceptible is the plastic mind of childhood when consciously brought into contact and sympathy with Nature, by a teacher competent to be her interpreter, I mention two out of a multitude of similar illustrations. An eminent botanist narrated to me the following personal incident: "When I was a mere boy, my teacher, handing me a flower, asked me to notice *all* its parts, and when I had done so, for the first time in my life, he gave their several botanic names, introducing each with its Saxon synonym, which I never forgot. That brief talk of twenty minutes inspired me with an interest in observation and study that led to collegiate culture." Said another gentleman, author of popular text-books on Natural History: "My teacher once invited me to search on my father's farm for curious stones. I found a white stone, with sharp edges, of which he said, 'That is a good specimen, though very common, for three-quarters of the earth's crust is made up of this stone. It is very useful. The grains and grasses get the sharpness and strength of their stalks from a minute portion of this stone, which the rootlets dissolve and send up for their growth. It is useful also in the arts. You have it in the wall and common plaster. Glass is made of it, only a little stuff is mixed with it to make it work well, and the very best spectacle-glasses are made of pure specimens of stone like this,' showing me a pure quartz crystal, and pointing out its exact hexagonal form and pyramidal cap. That brief talk changed my history and fired my mind with love of learning."

The farmer's boys have the best opportunities of learning these practical lessons from nature, provided the teacher is competent to start them in the right lines of observation. On the farm, birds, insects, fishes, and all animals, flowers and foliage, plants, shrubs, creeping vines, and trees, to say nothing of the minerals under his feet, are all practical primary teachers.

In the interests of agriculture, and all industrial pursuits, our youth should be taught at school the necessity of *labor*, its vital relation to all human excellence and progress; the evils of indolence, and the absurdity of the common aversion to manual labor. This popular distaste for industrial pursuits should be *early* counteracted, and the silly and pernicious notions that labor is menial, and that the tools of the farm, or of a trade, are badges of servility, should be refuted in our schools, and more should there be said and done to dignify labor, and render industrial pursuits attractive and reputable. The agricultural, forestral, and industrial schools, so numerous in Germany, Switzerland, and other portions of Europe, have proved as efficient in dignifying labor as in increasing its efficiency and market value. Girls, as well as boys, are there early taught, both in the family and school, that to learn to be useful is alike their duty, privilege, and interest.

Many of our youth are afflicted with an ambition for easier lives and more genteel employments, and with the infatuation that city clerkships are the most eligible positions, while farming and the trades are not "respectable." Let them learn that the intelligent farmers or mechanics have a better chance of securing wealth, health, and influence than the over-crowded city clerkships can afford. In any average farming community, let twenty young men form a stay-at-home association, and employ their best skill in rural pursuits; and another twenty, we will suppose of the same capacity and education, start in quest of city clerkships, and at the end of twenty years I am confident our stay-at-homes would, on the average, have better health, better character, greater influence, and more money than the twenty who turned their backs on the humble industries of the country.

Clerks are often paid less than skillful mechanics, and are less independent. In their precarious positions, they are liable to disappointments and humiliating struggles with the thousands of others "looking for a place." Every advertisement for a clerk brings a whole swarm of applicants. How pitiable the condition of this superabundance of book-keepers and exchangers, wasting their lives waiting for a place, while our farms and factories, railroads and trades, are clamoring for educated superintendents, foremen, engineers, skillful managers, and "cunning workmen." The position of the educated and well-trained farmer or mechanic is far preferable to that of average city clerks. The latter may dress better, talk more glibly, bow more gracefully, not to say obsequiously, but they compare unfavorably with our best farmers and mechanics in manly independence, vigor of thought, and strength of character.

Too many of our young men leave the homestead on adventures less safe and reliable than the arts of industry. A good trade is more honorable and remunerative than peddling maps, books, pictures, patent-rights, and clothes-wringers, or in a city store to be cash or errand-boy, store-sweeper, fire-kindler, or even book-keeper. Without in any way disparaging the useful position of the clerk, our young men may properly be cautioned against further crowding this already plethoric profession. To the boys in the country I say, instead of aspiring to an uncertain and precarious clerkship, stick to the farm, or learn a trade, and you will lay the broadest foundation for prosperity.

The value of work as an educator hitherto too little appreciated, needs to be taught in our schools. Children learn by doing. This principle underlies the whole Kindergarten system. Its prime motto is, "Do nothing for the child which he can be encouraged to do for himself." His planning, combining, constructing, and designing, with simplest materials, foster interest and skill in work. It would be a grand achievement if the public schools should lead our youth to realize that their education is essentially deficient until they have learned to work in some useful form of industry.

Such was the theory and practice of the ancient Hebrews, carrying out the plan given them from Heaven. That is plainly the Divine plan for the race. The Hebrews held that all children should be taught some handicraft as an essential part of education. Among them labor was always honorable. No man was ashamed of his trade. No matter what his rank, every one must be trained to work. The chief of the Apostles did not degrade his high office by occasionally resuming his trade of tent-maker. By his own example, he enforced his precept "if any would not work, neither should he eat," and sharpened his censure of "the disorderly busy-bodies working not at all." His associates never suspected that their old business of fisherman was disreputable. Why was it that the Great Teacher, when all possibilities were open to his choice, sought out the humble home of the carpenter and worked patiently at His reputed father's trade, except that He might condemn before the world the unchristian and heathenish notion that labor is menial. On the other hand, the Chinese Mandarins who let their nails grow as long as their fingers, to show that they never work, are the illustrous predecessors of the pretentious snobs who affect to despise the industrial arts.

The Jews still maintain their ancestral pride and faith in *work.* Notwithstanding long ages of bitter persecution, they are, as a race, most remarkable for perseverance, energy, and ability. These manly traits have been fostered by their hereditary habits of industry. Debarred by oppressive laws for many centuries from the ownership of land and from the ordinary industrial pursuits, they were driven to trade, which naturally continues to be their leading occupation, and in which they have gained marked success by dint of indomitable energy in the face of opposition and manifold difficulties. In his own life, as well as in Endymion, Beaconsfield has strongly illustrated the power of an indomitable will.

In every country, where the civil disabilities which oppressed them for so many centuries, have been removed, the Jews have soon risen to be leaders in education, in the press, in finance, in science and literature. Their wonderful ability and success seem to be the secret of the new and strange outbursts of mediæval intolerance and hostility which now disgraces Germany. The real trouble is, that the Jews so often outstrip their rivals and win the prizes which are open to fair competition. The complaints made in late German periodicals fully betray this unworthy motive. The outcry is "The Jews are monopolizing the best positions in the universities, absorbing millions of money, controlling exchange, becoming our leading capitalists, and even crowding into Parliament, and in danger of moulding the destinies of the nation."

It is a redeeming feature of this outburst of narrowness that the Crown Prince, who himself once thoroughly learned a trade, denounces the present persecution of the Jews as "a shame to Germany." No man in Germany has done more than he to make labor reputable. He has practiced as well as preached the gospel of work, having early learned the cabinet-maker's trade. At Babelsberg, near Potsdam, the summer palace of the Emperor of Germany, are shown choicest articles of furniture made by him. When his only sister, the Grand Duchess of Baden, placed her daughter in the *Schloss*, a famous school in Carlsruhe, she directed that she should be excused from none of the household industries required of the other pupils, that she should be trained in sewing and knitting, and made as thorough a seamstress as if she were expecting to earn her livelihood by her needle. Such royal examples of honoring industry have exerted a vast influence throughout the German Empire.

The tendency on the farm is to overwork the boys and allow too little respite for play, for with the young of all animals, play is the dictate of nature. The earth, the air and sea are full of animals who seem to luxuriate in playful activity. But, while all work and no play represses the jubilant impulses of childhood, the tendency of our times to all play and no work is far more harmful. Excessive amusements dissipate the mind, weaken the will, and demoralize the whole character—making one restless, selfish, discontented, and dependent. The habitual idler naturally degenerates into something worse, for idleness and vice are twins. Labor, though called the curse and consequence of sin, may be a blessing to beings constituted as we are. We need the spur of necessity to energize our minds. Our richest thoughts and experience, and our best discipline come to us when we are intensely active. Toils and privation seven, give strength, endurance, and courage for future achievements. The successful merchant who, with a fortune retires from business, and sits down to enjoy himself, with nothing to do but take his comfort, becomes the victim of ennuï, if not of dyspepsia.

Industry is essential to thrift and virtue, to mental, moral, and physical health. The Devil tempts everybody, but the idler tempts the Devil, who gives plenty of work to all whom he can find with nothing to do. The historian Froude, well says, "There are but three ways of living; by working, by begging, or by stealing; Those who do not work, disguise it in whatever pretty language we please, are doing one of the other two." Every man should have one vocation and as many avocations as he can. Men of mark are men of work. The most industrious individuals and races are the most intelligent and powerful; the most elevated morally as well as mentally. In whatever land man can subsist in indolence, he droops in intellect, and there is the greatest demoralization in those tropical climates where leisure rather than labor is the rule of life. Man rises in the scale where his necessities compel constant industry, as he sinks where his wants exact no labor. Where industry becomes habitual and skillful, it not only supplies mere necessities, but stimulates demands above absolute wants. Every pure enjoyment gained by labor, prompts the desire for other and higher gratifications. Theodore Parker said, "The fine arts do not interest me so much as the coarse arts, which feed, clothe, house, and comfort a people. I should rather be a great man as Franklin, than a Michael Angelo; nay, if I had a son, I should rather see him a mechanic who organized use, like the late George Stephenson, in England, than a great painter like Rubens, who only copied beauty." Edward Forbes says, "He who knows not what it is to labor, knows not what it is to enjoy."

I once began a census of the eminent men of Connecticut, those who have been most successful in business, or in the various professions, and found that the great majority of them had the discipline of rural occupations in their youth. The successive governors of our State, for a long time, with a single exception, were early accustomed to manual labor. The town of Lebanon has raised up five governors. Many retired rural districts and hill-towns have been fertile in the richest treasures of intellect. The Litchfield County Jubilee showed a proud array of her sons among the most distinguished men of our country. On the other hand, those who despised labor in their youth, have not been the benefactors of the community nor of themselves. "The artificers and inventors of the world, the men who revolutionize human industry and manifold the wealth and power of nations by new machines and new processes of art—the Watts, the Arkwrights, the Brahmahs, the Clements, the Nasmyths, the Stephensons, the Fairbairns, the Fultons, the Ericssons, the Goodyears, the Howes, the McCormics, have usually had their training on the farm or in the shops."

A striking illustration of the value of work as an educator has been recently furnished by Rev. Washington Gladden of Springfield. He sent a circular to one hundred of the most prominent men of that place, asking, "Was your home during the first fifteen years of your life on the farm or in the city, and were you then accustomed to work when not in school." Of the eighty-eight who replied, five only "had nothing particular to do," while ninety-four per cent. were farmer's sons, or hard-working boys. So everywhere, as he clearly shows, the prizes of life are carried off by the men who learned to work. Men energized by such discipline are sure to outstrip those who were dandled in the lap of affluence and enervated by excessive indulgence. The farmer's boy learns patience and persistence by doing tough tasks without flinching. Mr. Gladden's conclusion from his inquiry was that the boy early trained to work, has eighteen chances of succeeding in life to one chance for the boy without this discipline.

Farm work, by the great variety of its forms and conditions, is peculiarly fitted to task and test the mind of a boy in planning, contriving, and adapting means to ends under constantly varying circumstances. The necessities of the farm teach the needful lesson that "where there is a will there is a way." Coleridge said "a perfectly educated character is little else than a perfectly disciplined will." The *will* is by no means the only faculty to be educated, but its right culture involves that of every other faculty of the mind and heart. It is the will that differentiates men. This is the regal power of the mind, and more than anything else in our intellectual nature constitutes the man. A disciplined will equips the mind for action. An earnest will is the agent of every great achievement. There is nothing like it to make the mind resolute and successful, loyal to duty, superior to doubt, disdainful of ease, delighting in achievement and rendering toil, self-denial, exertions in whatever form, easy and pleasant. A resolute mind will spare no effort, neglect no opportunity to accomplish its end.

Labor develops inventive talent. The exigences of the farmer, remote from villages and shops, compel him to be something of a carpenter, joiner, blacksmith, and harness-maker—a man of all work—"handy at anything." His business varies with the seasons, and sometimes changes everyday. A farmer's boy myself, early trained in practical industry and familiar with farm work, I have ever valued highly those practical lessons learned among the rough hills of grand old Litchfield county.

I counsel even the sons of affluence to spend at least one season at hard work on the farm or in the shop. The practical business drill there gained, the knowledge of nature and domestic animals, will amply compensate for the consequent loss in book-learning, to say nothing of the health and physical training thus secured. With all our improved gymnastics, none is better than manual labor, when it is cheerfully and intelligently performed, and especially farm work. The habits of industry, once formed on the farm, or in the shop, may shape all the future, teaching one to value time, to husband the odd moments, to scorn sloth and love labor, or at least to practice diligence in business.

The pupils who luxuriate in the wealthiest homes of the city would profit by one year in the country, with its peculiar work and play, its freer sports and wide range for rambles by the springs and brooks, the rivers and water-falls, the ponds and lakes, over the hills and plains, through the groves and forests; in observing nature, searching for wild flowers and curious stones, learning to recognize the different trees by any one of their distinctive marks, viz., the leaf, flower, fruit, form, bark, and grain, watching the ant-hills, collecting butterflies and various insects, noticing the birds so as to distinguish them by their beaks or claws, their size, form, plumage, flight, or song. Studying nature in any one or more of these varied forms, each so fitted to charm children, would refresh their minds as well as recreate their bodies.

The simple elements of the practical sciences should be taught in our schools, at least in oral lessons. A few talks on Agricultural Chemistry will invite its fuller study when the school days are ended, especially in observing the chemical marvels that will meet one on every rod of his farm. The lectures given in our Teachers' Institutes on the geological characteristics of Connecticut, show how profitably our teachers might each give simple lessons on the prominent physical features of his town, county, and State. Such talks will intensify the interest of the farmer's boys in the study of the stones and rocks which line their pathway. Specimens of our most common minerals ought to be in all our schools, procurable as they are by any competent teacher, without cost. No pupil should leave the public school without knowing the names and leading characteristics of at least a dozen of our common minerals.

Familiar lessons should also be given about plants and animals, the laws of health and animal physiology. A few hints on "how plants grow" will add interest to the flora found in such great variety on every farm. With specimens in hand, a few minutes devoted to pointing out the difference between inside growers and outside growers (saying nothing of endogens and exogens) or between parallel-veined and net-veined leaves, or the evergreens and those trees which drop their leaves annually, will awaken a lasting interest in the study of botany. How early children may learn the difference between the animal, vegetable, and mineral kingdoms, or that some animals have jointed backbones, that others have their bones outside of their bodies, while others have none at all. Such glimpses of the beauties and wonders of science awaken a healthful desire to observe and study. I remember well the interest awakened at a Teachers' Institute in Massachusetts, when Prof. Agassiz gave a lecture on the grasshopper. Having by the aid of the boys collected several hundred grasshoppers and etherized them so that they would not jump about, he passed one to each of his auditors. This created general laughter, and seemed ridiculous to many. But soon instead of laughing, or looking at him, every one was looking intently at the object in hand. When he pointed out minute parts some one said "can't see them," to which he replied "look again and learn to *look*, for I can see things ten times smaller than those to which I have called your attention. The power of the human eye is very great, and it is only the want of practice which sets such narrow limits to its powers. By learning how to examine *one* thing thoroughly, you learn how to see any thing. I present this subject to you teachers for the purpose of suggesting the desirableness and method of teaching Natural History in schools, and of using that instruction as a means of developing the juvenile faculties and leading them to the knowledge of the Creator."

If you ask, where can teachers be found competent to give such lessons, I invite you to visit our Normal School and observe how well its pupils are trained in the methods of teaching the elements of the practical sciences in our schools, and I ask the coöperation of the farmers in securing better qualified teachers for their children. By leading children to plant flowers, shrubs, and trees in the school-grounds, and by brief lessons on rural art, and especially on the beauty, variety, and value of trees, such an interest in their study and culture might be awakened as to make our youth practical arborists. Very little time would be required for those talks which would be sure to inspire an interest in arboriculture and in the broader subject of rural art and adornment. In this way, our public schools may prove a partial substitute for the schools of Forestry in Germany and other European countries, which have exerted there a remarkable influence in diffusing a general interest in arboriculture among the people. They regard forests as their friends, and understand their climatic influence and economic value in staying spring torrents, preventing summer droughts, as well as in supplying lumber and fuel. The Germans have a passion for nature, and love to frequent their beautiful groves and gardens, for parks and woods abound in and near their cities and towns. The rural and suburban adornment, now the pride and glory of so many beautiful towns in Germany, and the fruit of this revived love of arboriculture, is largely due to the influence and literature which have emanated from her schools of Forestry. Hence the wanton forest fires so common and destructive in America are comparatively unknown in Germany. The forest incendiary would be regarded as a common enemy, like the poisoner of an aqueduct, recklessly destroying that which it is the interest of all to preserve. Like their Forest schools, our public schools should create that healthful public sentiment which constitutes the best possible protection of the woods.

In connection with the Sheffield Scientific School, which by the act of the Legislature in 1863 became the College of Agriculture and the Mechanic Arts of Connecticut, the endowment of one or two additional professorships would inaugurate a department of Forestry. This could be done the more economically here, where the existing cabinets, laboratories, and philosophical apparatus might be utilized in forestral instruction. The endowment of such a department would prove a great benefaction to the State and to the country, opening new fields of investigation which would bear directly on the ultimate resources and permanent prosperity of the nation. The conclusions of foreign foresters, though confirmed by the broadest observations and experience in Europe, cannot all be wisely adopted in American sylviculture. Differences in soil, climate, and other conditions may affect trees in regard to their rapidity of growth, health, durability of timber, texture, elasticity and grain of the wood, and many other qualities. These vital questions can be determined only by careful investigations carried on in each country.

The Lombardy poplar, for example, was planted extensively in New England many years ago. Brought to England from the banks of the Po, in 1758, the facility of its propagation from cuttings, its rapid growth, its tall columnar outline in contrast with the spreading oaks and elms, soon made it a favorite in England, and hence with the fathers of New England. Sending out its almost upright branches all along its tall stem, it was much admired here, as it is still, by the Italians, and was of old by the Romans, who called it the *arbor populi*. But in New England, so many of its branches were winter-killed, that it soon became an unsightly collection of dead limbs, and it is now seldom seen. This is one of many illustrations of the necessity of adaptation to soil and climate, and of the fact, that some trees which thrive in one locality, will fail in another.

More than those of other workmen, the farmer's business binds him to his *home*. He lives on or near the soil he tills. Hence the farmer's home must often be somewhat isolated. To promote sociality and content, Col. Waring proposes that farmers should concentrate in villages, and for this purpose submit to the necessity of long daily journeys to their farms. This is unfortunately the European usage. There the cottages of the peasants are often crowded together more closely than are the homes in any well laid-out city, leaving scant room for outbuildings, to say nothing of gardens. This custom grew out of the necessities of a barbarous age as a protection from robbers, or out of that feudal system under with the serfs were crowded into huts under the castle-walls of their lord or chief.

The very isolation of the American farmer is one source of his conscious individuality, independence, and strength, when he is thus led to greater care and taste in adorning his home and grounds, and increasing the attractions of the fireside. It has long been my ambition to improve the homes and home-life of our farmers, and of all our industrial classes, and help them realize that the highest privilege and central duty of life is the creation of happy homes. The chief aim of the industries of life, whether agricultural, manufacturing, or commercial, and the great end for which government itself is worthy to be maintained, is that men may live in happy homes. "The hope of America is the homes of America," and the hope of Connecticut is the homes of Connecticut. You improve the schools by improving the homes, as truly as you improve the homes by improving the schools. Modern civilization relates especially to the homes and social life of the people, to their health, comfort, thrift, their intellectual and moral advancement. In earlier times and other lands, men were counted in the aggregate. They were valued as they helped to swell the revenues or retinues of kings and nobles. The government was the unit and each individual only added one to the roll of serfs or soldiers. With us the individual is the unit and "the government is of the people, and for the people, and by the people." America may be and ought to be the paradise of the laborer in the neatness, comforts, amenities, and attractions of his home. In no other way can the best interests of this nation be more surely promoted than by the elevation and ennobling of its home-life, and no agency can contribute to this grand advancement so universally and efficiently as our public schools.

RURAL IMPROVEMENT.

BY

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NEW HAVEN:
TUTTLE, MOREHOUSE & TAYLOR.
1880.

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Public interest in home and rural adornment is rapidly increasing. A little foresight will show that no rural community can afford to continue without some organized efforts for this purpose, such as have done great good in promoting public health, cultivating public spirit, quickening social and intellectual life, building up and beautifying towns, and thus enhancing the value of real estate. I shall be happy to coöperate with public-spirited citizens who are moving in this matter, and will lecture on this subject, without charge either for services or expenses, in any town in Connecticut. In this reprint from an official Report, a few local allusions are retained to show the original aim of the writer and the application of kindred plans and principles to other fields.

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RURAL IMPROVEMENT ASSOCIATIONS.

When, over ten years ago, an effort was begun to improve and build up our country towns,* it encountered, as I then predicted, some misapprehension and ridicule. During this period of quiet work, my faith in the final result has never faltered. But sooner than I expected, this Rural Improvement movement has assumed such large proportions as to silence cavil, and command the respect and coöperation of the wisest and best men of our State. There are now over fifty of these associations in Connecticut which speak for themselves. Their objects are manifold, of which the following are the more important:

1. To cultivate public spirit and foster town pride, is an object which should enlist the sympathies of all our citizens. Our youth should be trained in their homes and schools to be jealous of the good name of their town and State. Hence the history of our towns and our State should be generally taught in order to develop a just town and State pride. We are prone to underrate the great value of this feeling. The love of home and the love of one's town and State are akin. This sentiment formed in early life should grow with our years and attainments. The want of it indicates a serious defect of character. I believe with Dr. Bushnell that "the man who does not wish to love and honor the town and State in which he and his children were born has no heart in his bosom. We are too little aware of our noble history as a State, a history of such transcendent beauty, freshened by so many heroic incidents, having so great a wealth of character and achievement. This early history of Connecticut is really the most beautiful that was ever permitted to any people in the world." This cannot justly be called a partial but unfounded laudation of one's State. The Histo-

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* "How to beautify and build up our country towns" was the title of an article in my Report for 1869.

rian, Bancroft, a citizen of Massachusetts, biased by no Connecticut predilections says, in language as striking as that of Dr. Bushnell, "There is no State in the Union, and I know not any in the world, in whose early history, if I were a citizen, I could find more of which to be proud and less that I should wish to blot."

The sentiment that honors and cherishes one's birth-place is noble and ennobling. I am aware that a popular prejudice associates weakness and effeminacy with such taste and refinement. But this sentiment has ever characterized the greatest and best of men and is a prime element of true manhood. The cold and selfish soul is sterile in heroic virtues. There is an American railway king, now a millionaire, who seldom visits his native town, takes no interest in it, does nothing for it, and leaves even the old homestead and grounds, though still owned by him, neglected and forlorn. This fact alone naturally suggests a selfish, soulless character. Indeed such examples are too common. On the other hand, the greatest grandeur of intellect accords with fervor of filial feeling, with fondest home attachments and with refinement and delicacy of taste. It is perfectly in keeping with the intellectual greatness of Daniel Webster to find him fondly cherishing and beautifying the old homestead, enriching and improving the paternal acres and eloquently discoursing on the sacred associations of home, the transcendent sweets of domestic life, the happiness of kindred, and parents and children. Washington was as delicate, courteous and affectionate in his domestic relations and attachments as he was wise in council and courageous in war. A beautiful trait in Bryant's character was evinced by his devotion to the old homestead and the little secluded town of Cummington among the Hampshire hills, hallowed to him by the memories of father and mother, and the sacred associations of childhood. To that little town which he did so much to adorn and enrich and educate, he ever deemed it a privilege to make an annual visit—a summer visit with his household, often prolonged for weeks and months. That the early associations might remain, raising the old house, he built beneath and around it a stately mansion, so that the paternal rooms remained intact.

Ex-Governor Hubbard well says, "this work of Village Improvement* will not fail, I trust, to awaken public attention and provoke imitation throughout our State, and excite and even shame our own people into a larger public spirit and better efforts to redeem from negligence our rural homes and villages. Nearly all our towns are full of objects of natural beauty easy of development, and very many of them rich in legendary and historical associations. What is greatly wanted is something more of rural art and adornment. Something which shall beautify our country villages, educate public taste, make the homes of the fathers dearer to their sons and the local associations of childhood dearer to old age, and thus turn back, in part at least, the tide of migration from the rural towns, and make the city seek the country life and make it what it used to be in our own State, and what it still is in the oldest and most cultivated nations of the world."

In our declining towns especially, local pride and public spirit should be fostered. Discouragement, if not self-disparagement, has been their danger and a source of increasing weakness. Instead of the despair that says "it is of no use, the fates are against us, we are doomed to decline more and more," true courage and patriotism would face the facts, inquire into their causes, and, if possible, find a remedy. The lack of public spirit has contributed to the decline of many towns. The evidence of this is sometimes seen in dilapidated school-houses, poor roads, absence of sidewalks, and neglected common, cemetery or church. Remembering that what any people can be depends largely on what they have been, the history of our towns should kindle within us a just pride for the past and a new inspiration for the future. To this end, each town needs to be distinctly conscious of itself, jealous of its good name, liberal in supporting its schools and churches, adorning its park or "Village Green," cemetery and streets, and in every practicable way guarding its honor, and ambitious of its prosperity.

In New England, the township is the unit, but in the Southern and in many of the Western States the "parish" or the county is the unit, while the township organization is wanting or is comparatively insignificant. The maintenance of schools and roads and bridges, the support of the poor and many kindred matters which in New England are town affairs, are there managed countywise. The town organizations with the town meetings where every citizen is the peer of any other, have been one of the prime factors in developing the sterling traits of New England character. They have fostered that self-reliance, independence and energy which have given strength and vitality to our northern civilization and effectively aided in the maintenance of our free institutions. The influence and importance of the towns of New England was early and ably set forth by Samuel Adams. It was a sound motto of old John Adams, that "the ownership of land is essential to individual self-respect and thrift and to national dignity and prosperity." It is not the landless, but farmers, who have been foremost as defenders of liberty because they have been thus defenders of home. The free land tenure, the system of small farms grouped into townships from the early settlement of New England fostered the free, liberty-loving spirit of our fathers, without which the Revolutionary war would have been impossible, for these "little democratic republics" nurtured that capacity for self government to which was due the achievement of our independence.

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* Referring to the example set in Haddam.

Says Professor Joel Parker: "It was through these organizations that an industrious yeomanry, while following the plow, and the diligent tenants of workshops while handling their tools, were converted into an armed soldiery on the first news that the British left the limits of Boston and were marching into the country. The dragons' teeth that produced that harvest were sown in the shape of farmers and mechanics, who, holding themselves in readiness as minute men, required but the heat of warlike intelligence to burst into full life and vigor as a patriotic army. It was through these town organizations, and not through a want of patriotism elsewhere, that the support of the Declaration of Independence was more effectual in New England than in any other of the colonies."

Nothing analogous to our town system prevails in the Southern States or in England. The influence of these town organizations and town meetings, where all meet on a level without distinction of race or party or sect, has largely caused the contrast in the civilization of the North and the South, from our early history till to-day. In the language of Senator Dawes, "With the township here, its vital force unimpaired, New England can never become South Carolina or Mississippi, and without the educating influence that comes of the town, neither South Carolina nor Mississippi will ever become New England in the enjoyment of liberty regulated by law. They are the very corner-stone of republican institutions among us, and they or their equivalent must take the place of that unorganized parish system by which Southern plantation society is loosely linked together, before a representative republic, in anything else than name, can be maintained among them. The town is not therefore to fade, but is to continue to be the nursery of intelligent, untrammeled, thinking freemen, the source, the supply of the government they themselves have instituted on this continent." My sympathies and efforts have long been enlisted in behalf of the declining towns which most need help and encouragement.

This is one source of my interest in the work of Rural Improvement, now so widely diffused through the State. Connecticut cannot afford to allow any of these old towns to die out. Many of them have a noble history, and if we of the present generation do our duty, they are to have a grand future. A most encouraging history would be that fitly recording the achievements of those who have gone out from these rural districts which are thus continually enriching the great centers of population and wealth.

2. To quicken the intellectual life of the people is an important aim of these associations. Besides the liberal support of schools, the founding of libraries is an important help in this direction which should be encouraged in all our towns. Their value cannot be over-estimated. The supply of good books increases the demand. A taste for books has been awakened in many towns by a well-selected library where the improvement has been as marked in the quality as in the quantity of the books read. Such a library naturally becomes the pride and treasure of a town, rendering it a more desirable place of residence, adding attractions to every intelligent home within its limits, and helping both

teachers and pupils in the schools. With books at hand, the teacher may be continually progressing. Without them he is in danger of getting into the ruts. The mind that ceases to progress soon retrogrades; unless himself eager for improvement, the teacher can impart no inspiration or love of knowledge to his pupils. While libraries educate the whole people, I have been especially gratified to observe how diligently their volumes are used by the school boys and girls who would otherwise have only the dime novel or papers more objectionable. Once give a boy a taste for good books and access to a choice library, and then place him where you will, let his calling be what it may, he will find time for study and will devote the intervals of labor to reading. Multitudes of men, thus self-educated, owe their eminence and success to an early taste for reading and access to libraries. Their example should show our youth that their evenings need not be idled away because the days must be occupied with business or labor.

3. The promotion of good fellowship is another aim. The charm of country life, so dependent on the interchange of neighborly courtesies and the maintenance of friendly relations, is often marred by needless strifes and alienations. The social life of a town is thus sadly embittered. A Rural Improvement Association tends to fraternize the people of a town by leading all classes to meet on common ground and *work* together for a common object. Thus differences of rank, or sect or party are forgotten, while as fellow-citizens they carry out plans of equal interest to all, and effectively combine to promote the general good. In some towns, good fellowship as well as intellectual improvement has been promoted by organizing reading circles. Selections in prose and poetry, often a play of Shakespeare, the several parts having been previously assigned, are the subject of careful private study and drill. These weekly circles make a profitable evening school. Their social influence is still more extended by an occasional "rehearsal" of a more public character. Divided as the residents of our rural districts and villages too often are by prejudice or neighborhood difficulties, every association where social amenities are cultivated should be encouraged. The support of a Village Reading Room, well supplied with

the leading journals of the day—daily, weekly, monthly or quarterly—is a movement in the same direction. A course of Lyceum Lectures is sustained by many Rural Improvement Associations, the profits of which are their "benefit" while the social opportunities thus opened are clear gain.

An annual festival under the direction of the Rural Improvement Association tends to deepen and sustain public interest in its work. In some towns literary exercises, addresses, a poem, and music, fill the programme; in others a collation becomes another bond of union and fellowship. In the rigid, and sometimes frigid, state of rural life, too often found in New England, we need to cultivate the social amenities and learn the art of "turning work into play." The supposed monotony and dullness of country life drive many to the city. It is wise to multiply occasions for social enjoyment. The arbor-day festival may help to counteract the tendency of rural life to isolation and seclusion, lifting out of the ruts of a dull plodding monotony, promoting neighborly feeling, and strengthening social ties. The rural laborers in Switzerland and Germany socialize far more than American farmers. Their festive spirit is a strongly-marked feature of their character. It is manifested in the family, in neighborhood greetings and meetings, in schools, in rifle feasts, in processions and various social gatherings. They have a passion for nature, and love to frequent their beautiful groves and gardens, for parks or woods abound in or near their cities and towns. This genial spirit is everywhere fostered by music—both vocal and instrumental. As a result, there is an inexpressible something in the German character that carries mirthful and happy childhood into old age, giving an added charm to social life, and lightness and cheer to sober work.

4. Another aim of these associations is the promotion of public health by securing better hygienic conditions in the homes of the people and in their surroundings. Some of our country towns, naturally favorable to health and longevity, have suffered fearfully from the ravages of diseases, evidently caused by neglect of hygienic laws. In many towns much has lately been done in the matter of drainage, removal of waste and guarding wells and water supplies from impurities.

5. The improvement of road *sides* is attracting much attention. Some towns have made appropriations to clear them of brush and rubbish and keep them like a lawn. Others are adorning them with extensive lines of trees.

6. The improvement of roads, though of great importance, has secured less attention from these associations, as the town authorities usually care for them, and other objects are more urgent. Dr. Bushnell well says: "The road is that physical sign, or symbol, by which you will best understand any age or people. If they have no roads, they are savages; for the road is the creation of man and a type of civilized society. If you wish to know whether society is stagnant, learning scholastic, religion a dead formality, you may learn something by going into universities and libraries; something, also, by the work that is doing on cathedrals and churches, or in them; but quite as much by looking at the roads. For if there is any motion in society, the road, which is the symbol of motion, will indicate the fact. Nothing makes an inroad without making a road. All creative action, whether in government, industry, thought or religion, creates roads."

7. The making or improving of sidewalks meets a felt want in many towns. In no other way can the comfort and sociality of a village be promoted so economically as by making sidewalks. Simple gravel walks, when the concrete would be too expensive, serve an admirable purpose. One town has lately completed many miles of neat sidewalks, which add greatly to the attractiveness of the village.

The fine footways abounding throughout England invite the pedestrian habits of the women of that country. It is largely because they exercise daily in the open air, that they retain so long the bloom and vigor of youth. More outdoor rambles would promote the health and prolong the lives of American women. Besides favoring the luxury and healthfulness of open air exercise, footways invite friendly calls and foster social life and rural enjoyment.

8. Street lights remove another hindrance to social intercourse in country villages. When the day's work is done the evening is the favorite time for calls, if the darkness does not forbid. The cost of kerosene illuminators is now moderate.

It is one of the signs of social advancement that many of our associations are thus practically saying "Let there be light."

9. Increased attention is given to parks, the village green, the cemetery, church grounds, school lots and other public grounds. I hope hereafter to give a brief sketch of the public parks of Connecticut, some of which are already exceedingly beautiful. Others are now planned which will contribute greatly to the beauty and adornment of our State.

Two fine parks, recently provided by private munificence deserve a special mention. On the thirty-first day of October, 1878, Hon. David Dudley Field, Stephen J. Field of the United States Supreme Court, Cyrus W. Field, and Henry M. Field, D.D., surviving sons of Rev. David Dudley Field, D.D., appropriately celebrated the seventy-fifth anniversary of their father's marriage by presenting to the town of Haddam two tracts of land for a public park. These grounds, finely laid out with drives and walks by Mr. Olmsted of New York, the landscape gardener, and adorned with the choicest ornamental trees, indigenous and imported, is a grand contribution to the taste, sociality, good fellowship, education, growth and prosperity of the town. Isinglass Hill, a high bluff on the eastern border of these grounds commands for many miles a magnificent view of the Connecticut river and its valley, with the long range of hills beyond. In behalf of the friends of rural adornment and of education, so far as I may represent them, I desire to express to the eminent Field brothers, a high appreciation of their grand gift to Haddam and thus to Connecticut, for our *State* takes a lively interest in the growth and prosperity of each of her towns. This worthy example ought to make many others, opportune as it is, in view of the growing interest in rural improvement throughout our State. There is hardly one of our towns, that has not at home or abroad, some favored sons who by forming parks or founding schools or libraries, could easily render this most fitting tribute to their mother soil, and thus be gratefully recognized as the benefactors of their fellow citizens and of future generations. The ambition to beautify and benefit one's native town is worthy of the best and noblest characters. There is a rare luxury in witnessing the fruits of one's benefactions, giving while living and able to enjoy the rich results, rather than leaving legacies to be lessened or lost in the wrangles of contending heirs.

The value of a park was happily set forth by Hon. David Dudley Field in the following presentation address given before a large concourse of people at the dedication of these grounds.

"We are here to deliver into your hands the parcel of ground on which we are standing, and that other which lies in view before us, to be kept as pleasure grounds for the people of Haddam in all time to come. We give them in memory of our father and mother, who were married seventy-five years ago to-day, and came immediately afterward to make their abode on this river-side, where he was soon to become the pastor of the church and congregation. Here they lived active and useful lives, in the fear of God and love of man, doing faithfully their several duties, he in public ministrations from pulpit and altar, at bridal, baptism, and burial, and she in the quiet tasks of her well-ordered household. Here they passed their first years together; here they raised their first domestic altar, and here most of their children were born. For this cause, and in grateful remembrance of their love and sacrifices for us, we, their surviving children, four of us only out of ten, present these memorials, not of cold stone, though the hills about us teem with everlasting granite, but of shaded walks, green lawns, and spreading trees, where this people may find pleasure and refreshment, generation after generation, so long as these fertile meadows, these rugged hills, and this winding river shall endure. And remembering that "beauty is truth, truth beauty," we hope that they will cultivate here that love of nature, which is a joy in youth and a solace in age; which nourishes the affections, and refines while it exalts; which rejoices in the seasons and the months as they pass, with their varying beauties; catches the gladness of June and the radiance of the October woods; and in every waking moment, sees, hears, or feels something of the world around to take pleasure in and be grateful for. We trust that they will come, not in this year only or this century, but in future years and centuries, the fair young girl, the matron in the glory of womanhood, the boy and the man, grandson and grandsire, in whatever condition or circumstance, poverty or riches, joy or sorrow, to find here a new joy or a respite from sorrow; to drink-in the light of sun and moon, listen to the music of birds and winds, feel the fresh breath of life-sustaining air, thank God and take courage.

"Reverently then we dedicate these memorials of our parents, to the enjoyment forever hereafter of those, and the descendants of those, whom they loved, and among whom they dwelt."

Roseland Park, in Woodstock, promises to be one of the largest and finest private parks in the country. It includes sixty acres of land, with an undulating surface, bordering on Woodstock Lake, a beautiful pear-shaped sheet of water one mile long and half a mile wide, situated in a broad amphitheatre of wooded hills and fields, some fifteen miles long and five miles wide. The park contains three miniature mounts, the highest of which is Mount Eliot, so named from the "apostle" John Eliot who preached to the Indians in Woodstock, and as tradition has it, upon this hill. About one-quarter of the ground, including the three hills, is already a well-wooded grove of chestnut, oak, maple, beach and butternut, many of which have reached majestic proportions. About 2000 ornamental trees of choicest varieties have recently been planted in these grounds and along the many paths and drive-ways. Over 8000 flowering shrubs, plants and rose bushes have also been set out. 200,000 loads of sand and loam have already been used in filling up marshy spots and inequalities and in grading walks, avenues and grass-plots, and as much more will be required to complete the present plans. The tasteful buildings erected on the "made grounds" near the lake are a fine boat and bath house, a keeper's lodge with ample stable and shed. A windmill supplies the dryer portion of the park with water.

The citizens of Woodstock, and of Windham county, owe this magnificent park to Henry C. Bowen, of the New York *Independent*, who has already expended upon it over $40,000. Though the work is rapidly progressing and Mr. Bowen usually devotes five hours a day during the summer to assisting and directing these improvements, the work will not be completed till 1884. This park, accessible to all classes, is a favorite place of resort to the citizens of Woodstock and indeed of Windham county, who gratefully appreciate the taste and liberality of the proprietor. Thousands of people annually gather here to celebrate the fourth of July, and listen to the distinguished speakers invited to address them. In view of the number and eminence of the speakers and the wide range of their topics this celebration on these beautiful grounds is quite unique.

10. The educational bearings of this subject, if less obvious, are not less important. The external improvements prompted by these associations have in many towns developed a local pride and public spirit which have displaced many a bleak, weather-worn and comfortless school-house. Public interest once enlisted in the adornment of streets, parks, cemeteries and kindred plans is sure to embrace the school-house. The people are learning that village improvement promotes the growth and prosperity of a town by inviting wealthy and desirable residents from abroad, just as neglected streets, school-houses and other signs of an illiberal policy invest a town with an air of discouragement and decay. The influence of such an association in cultivating the taste, fostering the study of nature, developing in youth a love of flowers, vines, shrubbery and trees, all the stronger because they have planted or cultivated them, thus fostering domestic attachments and checking the excessive passion for city life, suggest some of the ways in which it supplements the work of the school. The love of nature sharpens the senses and quickens all the intellectual faculties. An early interest in natural history favors habits of observation and trains both the memory and imagination.

The taste should be early cultivated. To love the beautiful should be held as a religious duty. In the very structure of our being, God rebukes the ignorance or indolence that so often dwarfs this noble faculty, designed to be an ally of virtue subordinating the animal and sensuous to the intellectual and spiritual. The love of the beautiful may become a source of high enjoyment, and give new incentives to mental effort. It reverently admires nature and makes her a constant teacher.

"No department of mind ought to be placed higher than the love of the beautiful. The love of beauty in God must be immense. The love of beauty carries a high moral quality with it. It is a law that we should worship God in beauty. Nowhere was it more powerful than in the temple. We see it in Revelation. The love of beauty increases in people the idea they have of the truth."

A true Christian culture should lead our citizens, each to adorn his town, village, street, school-house, and first of all his home. Every tree, flower or shrub in the garden, every tasteful engraving or painting in the house, may add a new link to the golden chain which should ever bind the heart of childhood to the hearth-stone. Let taste brighten the joys of the domestic circle, and help to invest every scene in life with higher significance and beauty. The esthetic element as an educational force has been often ignored, and the craving of the juvenile mind for the beautiful rudely repressed.

Nature is the great educator. Birds, flowers, insects, and all animals are our practical primary teachers. In God's plan, facts and objects as best seen in the country are the earliest and the leading instruments of developing the faculties of the juvenile mind. They cannot be fully trained when cooped up within brick walls, witnessing only city scenes.

In all our history the country has proved the great school of mind. Here dwell and for wise reasons, here God intended should dwell, the great majority of mankind. The country sends far more than its proportion of gifted men to the great centers of influence. It is thus continually enriching the cities, for towards them are flowing, like their streams, the material and still more the mental treasures which have their origin in the mountain springs and without which the cities would die out. Called officially to visit all the towns of Massachusetts and Connecticut, I have often asked "what eminent men have you raised here." Almost every town can give a list of which they are justly proud. A most instructive history would be that which should fitly record the achievements of those who have gone out from these rural districts to fill positions of commanding influence. In the language of Dr. Bushnell: "It is not in the great cities, nor in the confined shops of trade but principally in agriculture, that the best stock or staple of men is grown. It is in the open air —in communion with the sky, the earth and all living things —that the largest inspiration is drunk in and the vital energies of a real man constructed." Certainly the country may claim superior advantages for the physical, mental, and moral training of the young, wherever good schools are maintained.

Though I studied the Kindergarten system in Germany, and advocate it, I still contend that the best sort of Kindergarten is the open fields and varied objects of the country, if only the eye be trained to habits of careful observation. There, things are studied more than mere words, or rather the perception of objects and their qualities furnishes the material for thought and gives precision to language. Hugh Miller used to say: "The best school I ever attended was the miscellany of objects and circumstances surrounding me in my native district, challenging the first exercise of my senses and my fancy and that is a species of education open to all . . . . Open your eyes, the commonest objects are worth looking at, even weeds and stones and the most familiar animals." He was educated by the rocks of old Cromarty on the shore of the North Sea. Scott was educated by the sounding surges of the sea. Webster was educated by the Salisbury Mountains. How different would have been the history of Washington had he spent his youth amid the excitements and diversions of a great city like London. Would Jefferson have attained his eminence and power, had he been early dandled in the lap of affluence in a city like Paris? How different would have been the career of the great naturalist of our day, had he spent his childhood in a large city. How fortunate for Agassiz and for the world that his native home was in the beautiful little village of Mottier in Switzerland, lying midway between the lakes of Neuchatel and Morat. The woody hills, the gardens and vineyards, the banks, cascades and lakes; the Jura and more distant Alps, with magnificent glaciers, glistening fields of snow and ice; these were his early teachers. His very sports served to convert the observing boy into the future naturalist. These were boating, fishing, hunting, studying birds and turtles, gathering bugs, butterflies and other insects, roaming in the woods, taking long excursions on Lake Neuchatél, in whose waters clear to an unusual depth he could find the haunts and study the habits of the fish; climbing steep hills and rocky cliffs and even ascending the magnificent precipices of the Jura. Living much in the open air, he observed the birds so as to distinguish them by their beak, claws, size, form, plumage, song or flight. If in early life he knew less of books he had studied nature more.

The late Charles Hammond, one of the most successful of American teachers, used to say he was educated by the grand scenery of his native town—Union—comprising the highest land in the State east of the Connecticut river. From the homestead, he could see the church spires in many of the surrounding towns. From a hill near by, he used to "gaze at Wachusett Mountain in Massachusetts, and in a clear day could distinctly see the deep blue peak of Monadnock in Jeffrey, New Hampshire." To continue his own words, "my father observed nature and loved flowers, and early taught me to observe the properties of plants and trees, and learn the names, habits, retreats and voices of the birds." He often revisited this grand scenery to which he attributed the inspiration of his youth.

I often advise the sons of wealth in our cities to spend at least one year in the country, with its freer sports, and wider range of rambles, or better still, for both physical and mental training, to give one season to hard work on the farm or in the shop. The practical skill thus gained in adapting means to ends in observing things, common objects and animals, may compensate for some loss of book learning and lead one afterwards, like Agassiz, to pursue text-books with greater zest.

11. My interest in this work centers in the improvement of the homes and home life of our people. "The hope of America is the homes of America," and the hope of Connecticut is the homes of Connecticut. There remain still too many homes and grounds desolate, neglected and repulsive, where taste and trees, shrubbery, hedges or creeping vines with a lawn would make "the wilderness blossom as the rose." Unquestionably, neglect and slatternliness in and around the house repel from their rural homes many youth who might otherwise be bound

in strongest ties to the fireside. Our farmers and mechanics, or their thoughtful and thrifty wives, are beginning to realize how easily and economically, often without any outlay of money, they can surround their homes with flowers, the Virginia creeper, grape vines or trees, and thus increase the beauty, the attractions and market value of the homestead. These embellishments of the home and grounds help to cultivate domestic sentiments.

Without a Rural Improvement Association our best towns fall far short of what they might be and ought to be. Too often, neglected private grounds, dilapidated dwellings, barns or sheds, or a street ugly with piles of decaying brush or chips, discarded fruit cans, broken harrows, carts or sleds, a front fence with missing pickets and a disabled gate, give an air of shiftlessness that sadly mars the effect of an otherwise beautiful village. Here an Association is needed to develop that private taste and public spirit which will remove such defects and disfigurements. When every citizen is thus stimulated to make his own grounds and wayside not only free from rubbish, but neat and attractive, the entire town becomes so inviting and home-like as to give new value to its wealth and new attractions to all its homes. Such affectionate care and attention to the homes indicate a kindly, intelligent, home-loving people, and no better praise need be given to any people than that they tenderly cherish their homes. A stranger can hardly drive through such a town without saying "Here are people of refinement, who love their homes, and therefore tastefully guard the surroundings of their daily life." These surroundings, trifling as they seem to some, are the more important, because they are constant forces in moulding character. "Cleaning up, dusting, putting things in order," are little matters in the parlor, sitting-room or kitchen, yet how soon each becomes forbidding, when these trifles are neglected. Just so in a village, these minor matters neglected, and the comfort, content, reputation and prosperity of a whole community suffer, but worst of all, home life suffers and character deteriorates.

Modern civilization relates specially to the homes and social life of the people, to their health, comfort and thrift, their intellectual and moral advancement. In earlier times and other lands, men were counted in the aggregate. They were valued as they helped to swell the revenues or retinues of kings and nobles. The government was the unit, and each individual only added one to the roll of soldiers or serfs. With us, the individual is the unit and the government is for the people as well as by the people.

It is a good omen that public interest in the embellishments of rural homes and villages is widely extending, and that the varied charms of the country with its superior advantages for the physical and moral training of children are attracting many thoughtful men to the simpler enjoyments and employments of rural life. With the growth of public taste the day is not distant when beautiful country seats and villages will abound throughout Connecticut. Dr. Bushnell, with his keen observation and intense love of rural scenery was wont to say, "No part of our country between the two oceans is susceptible of greater external beauty than Connecticut." A taste for rural adornment is a source of physical, mental and moral health as well as enjoyment. The parentage of parks, lawns, trees, flowers, vines and shrubs becomes a matter of just pride and binds one to the spot he has adorned.

The hankering for city diversions and excitements, and ambition for easier lives and more genteel employments have brought ruin to multitudes and financial disaster to the nation. A great peril to the land to-day comes from the swelling throngs, ranging from the reckless tramp to the fashionable idler, who are ever devising expedients, foul or fair, to get a living without work. The disparagement of country life has been one of the worst tendencies of the times.

Every influence should therefore be combined to foster home attachments, for there is protection as well as education in the fervent love of home with its sacred associations. Patriotism itself hinges on the domestic sentiments. When one's home becomes the Eden of taste and interest and joy, those healthful local ties are formed which bind him first and most to the spot he has embellished, and then to his town, his State and country. Whatever adorns one's home and ennobles his domestic life, strengthens his love of *country* and nurtures all the better elements of his nature. On the other hand, no man without local attachments can have genuine patriotism. As happy in one place as in another, he is like a tree planted in a tub, portable indeed, but at the expense of growth and strength. Said Monsieur Lariaux, the French Deputy to the American Evangelical Alliance, in his farewell address, "your homes, homes, *sweet* homes—these are the safeguards of your freedom. Oh, pray, as you gather at your family altars, that my poor France may have such homes."

In traveling thousands of miles annually for many years, my experience has led me to expect kindness and refinement in the humblest hamlet to which flowers, well trimmed shrubs, or neat and cultivated grounds invite. But these outward adornments of the house, however valuable, are but symbols of what should be the attractions of its inner life, realizing the highest beauty in the unwearied and delicate attentions of each to all. The central duty of life is the creation of happy homes. The higher aim of the industries of the world, whether in agriculture, manufactures or commerce, and the purpose for which government itself is worthy to be sustained, is that men may live in happy homes. Let then the sunlight of generous love fertilize our homes as the garden of God—worthy to be as heaven designed, a divine institution, the only earthly paradise, the best symbol of and the best school for the paradise above, the spot most sacred on earth, to be cherished with the most grateful memories in all the future. Back to this holy ground consecrated by flowers and shrubs and trees each tenderly associated with a mother's love and a father's care, let Thanksgiving gather the scattered circle. Let the Christmas tree bear some fruit, even for the youngest. Let the birthdays be happily observed, and the marriage anniversary joyfully remembered.

The home should be the first and chief place to promote a love of flowers, vines, shrubs and trees by cultivating them, and thus early develop a love for the beautiful in nature, in art and still more in character. We need more heartily to cultivate home affections, provide home enjoyments and foster home courtesies. In the every day intercourse of home, there should be a more sacred observance of the amenities of life and a freer interchange of kindly feeling. As flowers seem worthless to the thoughtless, so the morning and evening salutations in the family may seem little in themselves, but when fitly observed are mighty in their influence. As the sunbeam is composed of myriads of minute rays, so the home should be illumined and brightened by nature's richest hues without and still more by winning smiles within, cordial greetings, loving looks, gentle words, sweet laughter and nameless little kindnesses. Such beauties of nature and art, such amenities and affections should be the sunshine of home. They refresh and purify the social circle. Like the clinging vine, they twine themselves around the heart, calling forth its purest emotions and securing its most healthful activity. Such a home is worthy the name Ordinance of God. Such a heaven here will help prepare its members for the heaven above. Such an ideal may be an inspiration towards its realization.

If parents combine to make the circle of home-life beautiful without and within, they will sow the seeds of truth, kindness, honesty, and fidelity in the hearts of their children from which they may reap a harvest of happiness and virtue. The memory of a beautiful and happy home, and a sunny childhood is one of the richest legacies parents can leave to their children. The heart will never forget its hallowed influences. It is a fountain of enjoyment, to which the lapse of years will only add new sweetness. Such a memory is a constant inspiration for good and restraint from evil. If taste and culture adorn our homes, and grounds, and music adds its charms, our children will find the healthful pursuits and pleasures of rural homes more attractive than the pomp, and glare, and whirl of city life. Such early occupations and enjoyments will invest home life, and then school life and all ones future with new interest and value, with new significance and joyousness. For life is ever what we make it. We may by our blindness or folly or sin live in a world of darkness and gloom, or we may live in a world full of sunlight, and beauty, and joy, for the world without always reflects the world within.

12. These Associations have awakened new interest in tree-planting, both ornamental and economic. In answer to the question what ornamental trees to plant, I have usually recommended among our native trees the following, naming them in

the order of preference: The elm, maple, tulip, ash, linden or basswood, hemlock, white oak, black walnut, and hickory.

The white ash deserves more favor both as an ornamental and a timber tree. Combining lightness, strength, toughness, elasticity and beauty of grain in a rare degree, it is in great and growing demand for farming tools, furniture, interior finishing of houses and railroad cars, the construction of carriages, for oars and pulley blocks, and many other purposes. The excellence of our ash is one secret of the preference given abroad to American agricultural implements. It is hardy, will bear the bleakest exposure, is a rapid grower and attains large size, but will not thrive on poor lands. It is every way superior to the European ash, much as that has been cultivated and lauded abroad.

Connecticut is rich in its variety of native trees, having nearly sixty species, of which about forty are sizable for timber. The elm, when growing under favorable conditions, has been pronounced "the most magnificent vegetable of the temperate zone." The tulip tree or common white wood deserves much greater favor as an ornamental tree. It is a rapid grower, has a straight stem and attains large size. Taken from the woods when ten or fifteen feet high, it is not likely to live, but transplanted young from the nursery it proves thrifty and hardy. It is a common mistake to select too old trees for transplanting—so old that they must be beheaded. Not even the elm ever developes its full symmetry when subjected to such unnatural treatment. It is better to transplant all trees so young that with complete roots and good care they can grow without cropping.

Among imported trees the European larch should hold a prominent place. It combines the three qualities of rapidity of growth, symmetry of form and durability of timber. Mr. Maro Hammond, of Vernon, covered a worn-out, unsightly, gravelly hill in the rear of his home with a thousand larch, during this spring of 1880. If these thrive, he is to set out a much larger number next spring. John W. Nichols, of Branford, plants a large number this year. Three thousand larch and other exotics were set out in Clinton last year, besides many native trees. Some ten thousand larch trees were planted last spring in Pomfret to reclaim exhausted hillsides. If these experiments in recuperating sterile soils are successful, they may lead to important economic results in addition to the adornment given to fields now barren and unsightly. Grigor says, "No tree is so valuable as the larch in its fertilizing effects arising from the richness of its foliage which it sheds annually. The yearly deposit is very great; the leaves remain and are consumed on the spot where they drop." Trees also enrich the soil by a curious chemistry which disintegrates even the rocks, and transmutes their particles into forms of life and beauty. The radicles and rootlets, in their under-ground laboratory, secrete acids which dissolve the very sands and stones.

In many positions groves are of great service as wind-breaks; even narrow strips of trees afford a shelter to fruit trees and to various crops, as well as a shield to cattle from piercing winds. Evergreens serve best for screens, as deciduous trees are leafless when their shelter is most needed, especially for stock and around farm buildings. The evergreens most suitable for this purpose are the Norway spruce, white pine, Scotch pine, and Austrian pine; and next to these are the American arbor vitæ, hemlock, and spruce. Sheltered orchards are most productive and less likely to lose their fruit prematurely by violent winds, and the farmer with proper wind-screens consumes less fuel in his house and less forage in his stables.

In some portions of Germany the law formerly required every landholder to plant trees along his road frontage. Happy would it be for us if the sovereigns of our soil would each make such a law for himself. Happy, also, if the law of usage, fashion, or interest here, as did the civil law there, required that every young man before he married should plant a wedding tree. In some of our Western States tree-planting by the road-side is encouraged by a bounty from the State treasury, and in the fields by both a bounty and exemption from taxation for a term of years. The law in Minnesota provides that "every person planting, protecting and cultivating forest trees for three years, one-half mile or more along any public highway, shall be entitled to receive for ten years thereafter an annual bounty of two dollars for each half-mile so planted and cultivated, to be paid out of the State treasury; but such bounty shall not be paid any longer than such line of trees is maintained." I may be pardoned for repeating a personal allusion. The maples which I planted, when a mere boy, before the old homestead in Litchfield county, are now beautiful and stately trees. As I have often said, they have paid me a thousand-fold for the work they cost, and added new charms to that beautiful spot, to which I count it a privilege to make an annual visit. Among the memories of my boyhood, no day has recurred with such frequency and satisfaction as that then devoted to tree-planting. My interest in this subject is due to this incident (or perhaps accident) of my boyhood. I should be thankful if I could help put a similar incident, and an equally grateful experience, into the childhood of our boys of to-day.

In tree-planting, the economic and ornamental, touch at so many points that the cases are rare where they really diverge. Nothing, for example, can add so much to the beauty and attractiveness of our country roads as long avenues of fine trees. One sees this beautifully illustrated in France, where, for over a hundred miles on a stretch, the road is lined with trees. In many ways the first Napoleon's interest in arboriculture proved a benefaction to France. No time should be lost in securing the same grand attraction to the highways of Connecticut. Growing on land otherwise running to waste, such trees would yield most satisfactory returns. The shade and beauty would be grateful to every traveler, but doubly so to the owner and the planter, as the happy experience of many Connecticut farmers can testify. A grand work in this direction is already well started. No class can contribute so much to the adornment of our public roads as the farmers. They have already in abundance the very best trees for the roadside, such as the elm, maple, ash, American linden (or bass), oak, and in some localities the walnut. The hard maple will thrive in dry and gravelly soils, while the elm and red maple are specially desirable for moist, low ground. As the maples should be planted twenty-five feet apart, and the elms from forty to fifty, poplars or willows or trees growing rapidly from scions, may be placed between, to be cut down when their statelier neighbors require the room for their full development.

Tree-planting is fitted to give a needful lesson of forethought to the juvenile mind. Living only in the present and for the present, youth sow, too often, only where they can quickly reap. A meager crop soon in hand, outweighs a golden harvest long in maturing. They should learn to forecast the future as the condition of wisdom. Arboriculture is a discipline in foresight—it is always planting for the future, and sometimes for the distant future. Says Washington Irving, "There is something nobly simple and pure in such a taste for trees. It argues a sweet and generous nature to have this strong friendship for the hardy and glorious sons of the forest. There is a serene majesty in woodland scenery that enters into the soul, dilates and elevates it, and fills it with noble inclinations. There is a grandeur of thought connected with this heroic line of husbandry. It is worthy of liberal and free-born and aspiring men. He who plants an oak, looks forward to future ages and plants for posterity. He cannot expect to enjoy its shelter, but he exults in the idea that the acorn which he has buried in the earth shall grow up into a lofty pile, and shall keep on flourishing and increasing and benefiting mankind long after he has ceased to tread his paternal fields." It was the trees of his own planting at Sunnyside-on-the-Hudson, more than the beauty of the surrounding landscape, that led Irving to say, "After all my wanderings, I return to this spot with a heartfelt preference for it over all others in the world." It was the simple beauty he had created at Marshfield,—the grassy lawns, the shaded approaches, the hundreds of trees of his planting,—that bound Daniel Webster so strongly to that sequestered spot. The charm of Abbotsford, the grand Mecca of Scotland, comes mainly from its beautiful ivy and shrubbery and the thousands of trees planted by the hand of its illustrious proprietor. Says Sir Walter Scott, "My heart clings to this place I have created. There is scarce a tree in it that does not owe its being to me. Once well planted, a tree will grow when you are sleeping, and it is almost the only thing that needs no tending."

Over three million dollars have been expended in the last ten years in Connecticut, in building and repairing school houses. Wise and necessary as was this expenditure, had onehundredth part of this sum been spent annually in planting trees and adorning the school grounds, a still better result would have been accomplished in cultivating the taste of our youth, leading them to study and admire our noble trees, and realize that they are the grandest and most beautiful products of nature and form the finest drapery that adorns this earth in all lands. Thus taught, they will wish to plant and protect trees, and find in their own happy experience that there is a peculiar pleasure in their parentage, whether forest, fruit or ornamental—a pleasure that never cloys, but grows with their growth. Such offspring they will watch with pride, as every year new beauties appear. Like grateful children, they bring rich filial returns and compensate a thousand-fold for the trouble they cost. This love of trees early implanted in the school and fostered in the home, will be sure to make our youth practical arborists. They should learn that trees have been the admiration of the greatest and best men in all ages. The ancients understood well the beauty and hygienic value of trees. The Hebrews almost venerated the Palm. It was the chosen symbol of Judea on their coins and graven on the doors of the temple as the sacred sign of justice. The Cedar of Lebanon was the pride of the Jews and became to them the emblem of strength and beauty as is seen in Ezekiel's description of a Cedar in Lebanon with fair branches and with a shadowing shroud and of a high stature and his top was among the thick boughs. The height was exalted above all the trees of the field and his boughs were multiplied and his branches became long. Thus was he fair in his greatness, in the length of his branches, nor any tree in the garden of God like unto him in beauty.

The Egyptians, Greeks and Romans were proficients in tree planting. Hence Thebes, Memphis, Athens, Carthage, Rome, Pompeii and Herculaneum, as their very ruins still show, had each their shaded streets or parks. Two thousand years ago, it was the ambition of the richest Romans to maintain a rural home in or near the city as it is of the wealthy Londoner, Viennese, or Berliner to-day, and their ancient villas were most lavishly adorned. The Paradise of the Persians was filled with blossoming trees and long lines of roses. This taste for beautiful gardens was transplanted from Persia to Greece, and the greatest Greek Philosophers held their schools in beautiful gardens and groves. The devastation of parks, the destruction of shade trees, the neglect of public streets and private grounds, the decay of rural tastes and the utter slight of home adornments were clearer proofs of the great relapse to barbarism than the vandalism which merely destroyed the proud monuments of classic art and literature.

In tree planting, the beginning only is difficult. It is the first step that costs—at least it costs effort and persuasion to set this thing on foot—but that step once taken, others are sure to follow. On this account, I have tried various devices to get our youth initiated in tree-planting. In 1876 an effort was made to promote "Centennial Tree-Planting" by the offer of prizes, which proved successful far beyond my expectation. Many youth in Connecticut whose first experience as little arborists was prompted by those prizes, have become so interested in this pleasant work that they have continued it each subsequent spring. In 1878 the accident of the blowing down of a famous willow led me to offer them several thousand scions. Beautiful as that exotic is, I was careful to state that it is not comparable to many of our majestic natives, saying in a circular then addressed to our boys: "Because the main tug is at the start, on account of the inertia of ignorance and indifference, that start should be made easy. I should greatly prefer to start five thousand elms or maples this year in Connecticut, if it could be done as easily as my five thousand willow scions seem likely to be stuck in the ground. This proposal is made as a mere beginning in tree planting, sure to lead to something more and better."

These and other plans have manifestly increased the interest of our youth in arboriculture through the State. There is nothing more ennobling than the consciousness of doing something for future generations, something which shall prove a growing benefaction in coming years. Tree-planting is an easy way of perpetuating one's memory long after he has passed away. The poorest can in this way provide himself with a monument grander than the loftiest shaft of chiseled stone, which may suggest duty to the living while it commemorates the dead. Such associations grow in interest from year to year and from generation to generation. It will yield a rich harvest to future generations, if we can now stimulate a revival of arboriculture throughout our State. I confess to a grateful pride in the fact that something in this line has been recently accomplished in nearly every town of Connecticut. If this work is duly extended, our whole State will be transformed into a series of beautiful villages. Nothing can add such a charm to our country roads as long and magnificent avenues of stately trees.

The benefits that may accrue to our country from the discussion of tree-planting, were strikingly exhibited two hundred and fourteen years ago, when Sir John Evelyn published his celebrated work, entitled, "Sylva: or, a Discourse on Forest Trees and the Propagation of Timber." It was at once received with great public favor, and honored with royal commendation. He had remarkable success in awakening general interest in sylviculture. He was one of the founders of the Royal Society, and wrote this book at its special request, and that society has originated few books in the last two hundred years more useful than this which still survives in its grand results, although his other works on painting, sculpture, architecture, and medals have long since been forgotten. In many ways England has recognized her great obligations to the man who worked so lovingly and effectively for the good of his countrymen.

Disraeli, in his "Curiosities of Literature," fittingly says: "Had Evelyn only composed the great work of his Sylva, his name would have excited the gratitude of posterity. The voice of the patriot exults in the dedication to Charles II, prefixed to one of the later editions, in which he says: 'I need not acquaint your Majesty how many millions of *timber* trees, besides infinite others, have been planted throughout your vast dominions at the instigation of this work, because your Majesty has been pleased to own it publicly for my encouragement.' Surely, while Britain retains her situation among the nations of Europe, the Sylva of Evelyn will endure with her triumphant oaks. It was a retired philosopher who aroused the genius of the nation, and who, casting a prophetic eye towards the age in which we live, contributed to secure our sovereignty of the seas. The present navy of Great Britain has been constructed with the oaks which the genius of John Evelyn planted."

13. The economic bearings of this subject claim attention. The money wisely expended for the adornment and improvement of a town is a good investment. It pays in many ways. Such improvements help to retain in a town its wealthy and public-spirited citizens, whom a narrow and unprogressive policy would repel. Dr. Bodwell, who was long a resident in England, took a deep interest in this subject, when professor in the Theological Seminary of Hartford, and after journeying widely through Connecticut, said, "This village improvement all over our State is of great promise in a variety of ways. One most valuable result will be that a larger proportion of the enterprising young men will stay at home and cultivate the farms and make it a good thing too, with their intelligence and improved methods, and then the maidens will stay of course, and weddings will multiply, and the old homes will again be full of rosy children as in 'the ages past,' and the commonwealth will make a new and noble start in the career of riches and honor. In traveling over the State, one is constantly greeted with new surprises in the discovery of charming landscape pictures, with the finest possible sights for delightful residences; such as merchant princes might envy. England in its natural features is not comparable to Connecticut in wide variety of the picturesque and romantic. How exceedingly beautiful our little Commonwealth is destined to become at a future day, by the culture which is every day extending under the lead of village improvement associations, and in the erection of elegant country seats, is a thought continually suggested."

In the history of our towns public improvements and growth often stand related as cause and effect. Immigration from New York is one source of the increase of these towns. Since the solution of the long-vexed problem of rapid transit by the elevated railroads, Connecticut has the opportunity of inviting or repelling desirable residents in greatly increasing numbers. Growing rapidly as New York now is, where shall its swelling throngs of business men find their homes? A liberal spirit will invite wealth and population in still larger measure to our borders. The new comers from New York city to the shore line and other progressive towns are the friends of public improvements, because these are investments which ultimately enrich a community. A penurious policy is penny-wise and pound-foolish. It defeats its own aim of saving, and results in final deterioration and loss. Men of affluence and culture shun a narrow-minded and illiberal community. A good name tends to enrich a town as well as an individual, while a bad one may impoverish both.

14. There is no rural improvement more practical and valuable than the recovery of once fertile lands now lost to tillage. The waste lands of New England and the Atlantic states are already very extensive. They consist of, first, exhausted pasture land once arable, second, rough, rocky hills and hill-sides, formerly good grazing ground, but now so overrun with hard-hack or other useless bushes as to be worthless for pasturage, third, swamps, marshes, moors and bogs, and fourth, sand-barrens. Except the third class here named, nearly all these lands have been made barren by our improvidence and carelessness. My special aim has been to encourage the recuperation of such lands by tree planting.

For the reclamation of our pastures and waste lands abandoned to hard-hack, sumac, and other worthless brush, the European larch deserves to become a favorite. A native of the Alps, Apennines, of the Tyrol and Carpathian Mountains, it is a very hardy tree, and at home in a variety of well-drained soils, especially on rough, rocky, or gravelly ground, and the most rugged ravines. There are in our State large tracts of bleak hill-sides and mountain declivities or summits exhausted and now practically worthless, where the larch, thickly planted, would soon choke out all brush, and weeds. As an ornamental tree it grows finely even in deep and rich loam, but its extraordinary qualities for timber may be impaired when grown on the rich prairies of the West or the best lands of the East. When raised under right conditions, it combines the two qualities of rapidity of growth and durability of wood more than any other tree. More than two thousand years ago this wood was in high favor with the Romans for the building of ships and bridges. Julius Cæsar spoke strongly of its strength and durability.

I heard a lumber-man in Venice say that its durability was amply attested there, as most of the houses of the city are built upon larch piles, many of which, though in use for centuries, show no signs of decay. In a large Doge's palace, now used as a hotel, he showed me some very ancient larch window-casings which are still sound. For gondola posts in the canals adjoining the houses the larch is preferred. In wharves and many other positions in England, where there is an alternation of wet and dry with the tide, the larch has stood this most trying test far better than oak. In England it is regarded as the best timber for railway ties. Monville says: "In Switzerland, the larch, as the most durable of woods, is preferred for shingles, fences, and vine-props. These vine-props remain fixed for years, and see crop after crop of vines bear their fruit and perish without showing any symptoms of decay. Props of silver fir would not last more than ten years." Evelyn says: "It makes everlasting spouts and pent-houses, which need neither pitch nor painting to preserve them." Michie affirms that "For out-door work it is the most durable of all descriptions of wood. I have known larch posts that have stood for nearly fifty years." Professor Sargent expresses the opinion that "For posts it will equal in durability our red cedar, while in the power to hold nails it is greatly its superior." The chestnut railway sleeper, secreting an acid which corrodes iron, loses its power to hold the spikes in about seven years, though the tie itself may not so soon seriously rot. The larch, while it holds iron as firmly as oak, unlike the latter, does not corrode iron.

The president of the Illinois Central Railway, having examined the vast planted forests of larch in Europe and learned its remarkable fitness for railway ties, offers to transport the young plants free of charge to any point on their lines or leased lines, provided they are to be planted in the vicinity of the same. It is, however, an experiment which time alone can determine, whether the larch will retain its durability when planted in the level, deep, vegetable mould of the prairies, with their retentive sub-soil. That it will grow there rapidly and luxuriantly is amply proved, but its history for many centuries shows that elevated lands suit it better than low grounds, and side-hills and mountain slopes better than flats. In the rich river flats of Kew Gardens and in the vicinity of London the larch does not thrive. The specimens found in that remarkable collection of all known trees are puny. The Kew arborist informed me that in the two hundred and seventy acres appropriated to the arboretum, no spot had been found suited to the larch.

No other tree has been planted so extensively in Scotland. It attains maturity long before the oak, and serves well for nearly all purposes for which oak is used. Larch trees thirty years old are sometimes sold for fifteen dollars each, while oaks of the same age are not worth three dollars each. As the larch grows erect, with short and slender laterals, it may be planted much thicker than the oak. According to Loudon, ten acres of larch will furnish as much ship timber as seventy-five acres of oak. Its large timber yield per acre is one source of its popularity in Britain. It was first planted on the estate of the Duke of Athole, in 1741. Some stately specimens nearly one hundred and forty years old may be seen near the cathedral at Dunkeld. Mr. McGregor, the duke's forester, informed me that on this one estate have been planted over twenty-seven millions of larch trees, covering over sixteen thousand acres, some of which was formerly worth only from one to two shillings per acre. Dr. James Brown says he has seen matured crops of larch of sixty-five years' standing sold for from $750 to $2,000 per acre, when the land was originally worth only from $2 to $4 per acre.

The reclamation of marshes by drainage, both surface and subsoil, has been carried on for so long a period and on so broad a scale and with such grand results as to need no detailed discussion here. England, Ireland and Holland, to name no other countries of Europe, contain millions of acres of such land, now reclaimed and exceedingly fertile. Even lakes from ten to fifteen miles in length have been drained. In 1848 was completed the draining of the Lake of Haarlem in Holland. The lands thus recovered have since been sold by the Government for nearly $3,500,000, or about $80 per acre. The success of this grand experiment has prompted others, like the draining of the Zuid Plas—a lake covering nearly 12,000 acres, and the great work now progressing to drain an arm of the Sheld, which will recover some 35,000 acres. Encouraged by the results of these enterprises, the Netherlandish engineers now advocate the stupendous project of draining the great salt water basin of the Zuiderzee—an inland sea which covers 1,300,000 acres. The Italians have nearly completed the work of enlarging and deepening the tunnel cut by the Emperor Claudius 1800 years ago, to drain Lake Celano. 30,000 workmen were employed on this subtearanean passage for eleven years. Though this remarkable undertaking—the wonder of that age—was successful, in the following reign it fell into disrepair and continued to be neglected for centuries. It is one of many proofs of the revived energy and enterprise of the present generation, rivaling their historic ancestors, that they have restored and surpassed this old Roman work. This new tunnel, more than four miles in length and costing over six millions of dollars, will ultimately recover for agricultural occupation forty-two thousand acres of most fertile land. Already some 36,000 acres of rich arable land have been reclaimed, on which the crops yield a profit of from thirty to thirty-six per cent.

While it is interesting to know the extent and success of lake drainage in the old world, in our country with millions of acres of virgin soil, such expenditures would be unwise. But in New England and the Atlantic States there are large tracts of bogs and swamps that may be easily and economically reclaimed by drainage. The hygienic advantages of stopping malarious exhalations from stagnant pools would be clear gain. This practice has been common in Europe for a long period. When the works now in progress in Hungary are completed, that country will have over a million acres of swamp land drained and brought under cultivation. Many thousand acres have thus been recently improved in Italy and similar works are now progressing in France and elsewhere in Europe. Much has lately been done in the same direction on our New Jersey sea coast, along the shore of Lake Michigan and somewhat in the New England States. Several successful experiments in swamp-drainage and securing land from overflow have been tried in California, thus already improving some 200,000 acres of land on our Pacific coast. The diking in and reclaiming the salt marshes along the seashore is worthy of increased attention. In Marshfield, Massachusetts, over 1400 acres of salt marsh have been already greatly improved by shutting off the tides of the ocean, at a cost of over $30,000. If the success expected attends this experiment, it will deserve to be repeated on a broad scale along our seashore. The improvement of moors and wet lands by spreading layers of sand is too familiar to need description. Tile drainage, though but recently introduced in this country, is rapidly growing in favor. Though more expensive than surface drainage, it produces far better results. In this way large tracts of wet land have been recently improved, especially in the Western States. The statistics from a single State will indicate the general progress in this direction. In 1876 less than five million feet of tiles were sold in Illinois: in 1877 over fourteen million feet were sold.

The extent of soil depletion in many of the Southern States, according to Dr. Tichenor of Alabama, is "painful and humiliating. The fields of Middle Georgia were once the richest cotton lands of the South. After wearing them out, the planters went to Alabama, and there repeated the same process of exhaustion. Now the line of greatest production has receded from the seaboard to Texas. Those who thus carelessly strip the soil of its wealth are traitors to those who come after them. This ignorant plundering of the soil is an evil which threatens our national stability. One cause of the long continued fertility of China and Japan is the care with which every element of the soil is husbanded."

The practicability and even the possibility of reclaiming the sand-barrens of the Atlantic States is so generally doubted, that it is needful to show what has been done in this direction under conditions the most unfavorable and where it was confidently predicted nothing could be made to grow. The feasibility of reclaiming our barren wastes, is proved by many facts abroad and at home. Our Atlantic sand plains were once covered with forests. The now bare, white sand hills of Provincetown were described by the Pilgrims, on their landing there, as well-wooded. The sand hills on the coast of Prussia were formerly wooded, down to the water's edge, and "it was only in the last century, says Geo. P. Marsh, "that in consequence of the destruction of their forests, they became moving sands. King Frederick William I. when in pressing need of money, sold the forests of the Freische Nehrung for 200,000 thalers, and the trees were all felled. Financially the operation was a temporary success, but in the lasting material effects, the State received irreparable injury and would now gladly expend millions to restore the forests again. The dunes of the Netherlands were clothed with trees until after the Roman invasion. The old geographers speak of vast forests extending here to the very brink of the sea, and the drifting coast dunes have assumed a destructive character in consequence of the improvidence of man. The history of the dunes of Michigan is the same. Forty years ago, when that region was scarcely inhabited, they were generally covered with a thick growth of trees, and there was little appearance of undermining and wash on the land side, or of shifting of the sands, except where the trees had been cut or turned up by the roots."

The sand dunes of Denmark cover over 160,000 acres—those of Prussia 110,000—those of the single province of Gascony in France over 200,000, and in all Europe the drifting sands, according to Pannewitz, cover 7,000,000 acres. Says Marsh: "There is no question that most of this waste is capable of reclamation by simple tree planting, and no mode of physical improvement is better worth the attention of civilized governments than this. There are often serious objections to extensive forest planting on soils capable of being otherwise made productive, but they do not apply to sand wastes which, until they are covered by woods, are not only a useless incumbrance, but a source of serious danger to all human improvements in the neighborhood of them."

This is a subject of practical interest to us because we have along the Atlantic coast as at Cape Cod, in Connecticut, at some points in New Jersey, and other Atlantic States, on the shores of Florida, on the Gulf Coast, on the eastern shore of Lake Michigan and elsewhere, long tracts of drifting sand that have done serious local damage. To stop this extension, considerable expenditures have already been made in several States to cover their surface with a vegetable growth.

But this reclamation of barrens and sand dunes has been carried on most extensively and successfully in France. These sand hills or dunes as they are called, stretched over a hundred miles along the coast of the Bay of Biscay, between the rivers Adour and Gironde. Ranging from 180 to 320 feet above the level of the sea, they are composed of white silicious sand rounded and reduced to minute grains by trituration. These grains are still too heavy to be borne aloft by the winds and scattered afar like the ashes of volcanoes. On the Atlantic shore of France, the prevailing and most violent winds are from the west and southwest. Hence at low tide, the sands dried by the sun and the wind were driven as along an inclined plane up the slopes which descend seaward and thus formed these growing dunes, which moving inland created great desolation.

Nearly a century ago Bremontier published a memoir on the reclamation of sand dunes. Under the patronage of the French Government, he successfully introduced the planting of the maritime pine along the Atlantic coast of Gascony. These plantations have been perseveringly continued from that time to the present, and now cover over 100,000 acres in that single district. Not only has this wide area been reclaimed and made productive soil, but a still greater extent of fertile land has been rescued from the destruction threatened by the advancing sand hills. In speaking of the monument erected to Bremontier in this now stately forest, Marsh says: "He deserves to be reckoned among the greatest benefactors of the race."

In planting the dunes, a barrier along the shore was found necessary at first to protect the young trees from the rolling sands which otherwise would bury them. A double line of paling was erected parallel to the shore and a hundred meters from high water mark—the second line being a hundred meters further inland. This paling is made of planks sharpened at the lower end and driven into the sand. Spaces of an inch between the planks allow sand enough to pass through to bank up equally on both sides and relieve somewhat the force of the wind by allowing it to pass through these openings. As the paling is covered by the sands the planks are raised one at a time. A movable frame with a long lever mounted on runners, so that it can be slid along the top of the fence, and having pinchers or a clamp and chain, is easily carried and operated by one man.

The total cost of planting and protecting the pines has sometimes been as much as $40 per acre. The timber of this plantation has long been a source of profit, affording both resin and wood. France now draws an annual revenue of 130,000 francs from the resinous products of these forests. But in this case the greater profit comes from the consequent protection of the adjoining country from the encroaching sands, which had formerly sterilized fertile regions and buried thriving villages. M. Samanos says that "in all France nearly one million acres (400,000 hectares) of desolate land, supposed to be doomed to everlasting sterility, have been reclaimed, and these savage deserts are now stocked with maritime pines which will become for the country a fruitful source of wealth, and supply some day the wants of the whole of France."

A liberal appropriation is now made annually for the continuance of this work. The whole extent of dunes in France that remains to be planted is nearly 80,000 hectares, or about 200,000 acres. A small subsidy is given by the State to those who own and plant them, but most of this land belongs to the State and is managed entirely by the Forest department.

These successful experiments, conducted on so broad a scale and for so long a period, clearly prove the practicability of arresting and utilizing sand drifts by the plantation of trees. What has been done abroad on the most unpromising beach sands may surely be accomplished under the more favorable conditions of our Atlantic barrens, not necessarily by planting the same trees or by the same methods, but by those plans which a study of the local climate and conditions in each case will suggest. The young plants in France have been sheltered at the outset by sowing with the pine seeds certain hardy weeds, herbs and grasses like the yellow lupin, which gave a temporary shade and protection, and by their decay helped somewhat to enrich the soil. Some arborists affirm that oats or rye, or our blue lupin which thrives in dry soil, will serve the same purpose on our barrens. I have not space to detail the kindred methods of recuperating sand barrens in other countries of Europe.

I can only name a few illustrations of the extent of this work. Hummel attributes the devastation of the Karst, the high plateau lying north of Trieste—until recently one of the most parched and barren wastes in Europe—to the felling of its woods, centuries ago, to build the navies of Venice. The Austrian government is now making energetic and thus far successful efforts for the reclamation of this desolate waste, having planted over half a million of young trees and sown great quantities of seed. In the vicinity of Antwerp less than fifty years ago was a vast desolate plan. 'Looking to-day in the same direction from the spire of the cathedral, one can see nothing but a forest, whose limits seem lost in the horizon. Forest plantations have transformed these barren lands into fertile fields. On the Adriatic, Baltic, Mediterranean as well as the Biscayan coasts the disastrous encroachments of the sea have been checked by forest plantations. Extensive plains, once barren sands south of Berlin, about Odessa and north of the Black Sea and vast steppes in Russia, are now well wooded. R. Douglass & Sons, of Waukegan, Illinois, who have been the pioneers in promoting economic tree-planting in the West, began four years ago the experiment of reclaiming barren sand ridges near the shore of Lake Michigan, trying pitch pine, white pine, Austrian pine and Scotch pine. Here, as on Cape Cod, the Scotch pine proved the best for reclaiming sandy barrens. With these facts from abroad and at home it cannot be denied that even the poorest soils of the Atlantic States may be reclaimed.

All sand wastes are by no means alike. Trees which will grow luxuriantly on one will pine away and die on another. The climate, too, varies, as well as the soil. The *soil* of Cape Cod and Nantucket is well fitted for the maritime pine, where it has been amply tried. It grows well for a season or two, but is sure to winter-kill in a few years. It suffers from the severity of the winter in Holland and Germany. Sea spray and saline constituents in the soil or air are fatal to some trees and favorable to others. A knowledge of the natural growths of each vicinity will favor adaptation to local conditions.

Though dry at the top, sand dunes and most sand plains and hillocks are *moist* a little below the surface, by reason of evaporization from the lower strata, retention of rain water and capillary attraction. The latter cause depends upon the size of the grain of sand. The finer the grain the greater is its capacity for receiving moisture and the longer is the moisture retained.

As this scheme of recuperating sand wastes will be regarded as chimerical by many who have not investigated the subject, I will cite facts found near home. Having made a trip on Cape Cod, expressly to inspect their reclaimed lands and confer with the intelligent tree planters there, who are the American pioneers in this work, I will summarize briefly the information gained from them. The amount of land planted with trees in Barnstable county is about 10,000 acres. Before the trees were planted these well-nigh worthless lands could be purchased at from 25 to 50 cents per acre. I was interested in the plantations of John Doane, of Orleans, the oldest living silviculturist in America (now 89 years of age), who has planted 170 acres. He has sold planted lands for $14 per acre, not worth over 50 cents before planting, which he considers a good investment. But the best pay has been his enjoyment of this work, so manifestly growing with the growth of these trees. The forests he has created have long been to him a source of pride and satisfaction, greatly improving the surroundings of his place, and thus helping to brighten and prolong his years. John Kenrick, of South Orleans said: "My experiments in tree-planting have been made on over a hundred acres now covered with trees from one to thirty-five years old, chiefly pitch pine. I am now trying Scotch and Corsican pine and European larch. My first aim has been to cover my worn out lands with beauty and verdure, and it has proved a successful and economic experiment. The seed of the pitch pine is worth from one to two dollars a pound, the higher price being in the end the cheapest. Fresh seeds *carefully gathered* are as sure to vegetate as corn. I have tried every method of tree-planting, transplanting trees from the smallest to those that are two feet high. This is a costly plan, but may be adopted when one wishes to save time, or desires a few trees as a wind-break or otherwise. In transplanting trees *immediately* from my own nursery to the fields, my favorite time is just as the buds begin to start in the spring. I have planted seeds both with a planter and by hand. On our light sands a man and a boy will plant three acres in a day—dropping six seeds in a hill, it will take about one-half a pound of seed to the acre. This is my favorite method and is more satisfactory in results though more costly than that of using the plough and planter. When the evergreens are two feet high I would thin them, leaving one thrifty plant in each hill. I do not trim till they get large and then cut off only the dead branches."

Tully Crosby, of Brewster, said: "In our small town about 1500 acres of old waste land have been planted with pitch pine. The Norway pine has not proved a success with us. Many old fields bought for fifty cents per acre and planted with pine twenty-five years ago, are now worth from $10 to $20 per acre. The pines grow well for twenty-five or thirty years and when cut off a second crop springs up immediately and this crop does better than the first. The pitch pine takes root and grows on our barren beach sand where no soil is perceptible. Our people are now planting trees every year. I have recently planted twelve acres. Two years ago I cut off a lot planted thirty years since and the land is now full of young pines scattered by the first growth. A man with a two-horse team and planting machine can plant ten acres in a day and three pounds of seed will do the whole."

E. Higgins, of Eastham, said: "Thirty years ago twenty acres of condemned tillage land, worth one dollar per acre, was planted with pitch pine. The present value of this land is $15 per acre. In 1870, 225 acres more of the same sort of land was thus planted, the present value of which is $8 per acre. About 150 acres of sandy land, utterly barren and not worth fifty cents to the acre have been planted, the present value of which is $7 per acre." John G. Thompson, of North Truxo, says: "About 650 acres have been planted in this town. The price of pitch pine seed for the last few years has been $1.50 per pound. Thirty years ago land in this town could be bought for tree planting at twenty-five cents per acre; now the same kind of barren land sells for $2 per acre for tree-planting. I find the expense of planting the pines to be $2.25 per acre."

S. P. Phinney, of Barnstable, said: "Large tracts of worn-out lands in this country, that were worth comparatively nothing, have been planted from the seed of the pitch pine. These experiments have proved successful. I know of no way in which the light sandy lands in this section can be made so valuable as by planting the pitch pine. Our experience proves that the cultivation of forest trees is feasible and profitable in New England seaport towns. In 1845 I planted in this town a ten acre lot with pitch pine seed, much as corn is planted, dropping three seeds in a hill and covering them with half an inch of soil. To-day many of these trees will gird more than a man's body. Hundreds of acres in this section are being planted annually."

We have a great Sahara in Connecticut less than ten miles from New Haven, produced by improvidence and neglect. The local traditions tell us that the sand-blow covering so large an area in the towns of North Haven and Wallingford was once finely wooded. Here and there clumps of low pines and birches, the lone relics of a former growth, still resist the drifting sands. So general is the conviction, that this sand-blow is utterly irreclaimable, that it has long since been abandoned to hopeless sterility. I shall be happily disappointed if my plan for utilizing it is not regarded by many farmers as visionary and impracticable. But the feasibility of reclaiming such wastes is proved by many facts. The cost of reclaiming the sand barrens on Cape Cod has been small—from three to five dollars per acre, but the profit has been satisfactory to the planters. The best time for planting the pine seeds is as early in the spring as the frost permits. The work is done by hand or by a seed-planter, and in rows about as thick as corn is ordinarily planted. On the Cape Cod barrens there was no vegetation, except a little moss, low poverty grass, so-called, and in some cases light beach grass.

Experiments are now in progress to fix the dunes or sand hills which threaten the Suez Canal by planting the maritime pine and other trees. I visited the celebrated forest of Fontainbleau in France, which covers an area of sixty-four square miles. The soil of this wide tract is composed entirely of sand and apparently as dry as the sand plains of Wallingford, Conn. Jules Clare, a student of forest science of world-wide fame, says, "the sand here forms ninety-eight per cent. of the earth, and it is almost without water; it would be a drifting desert but for the trees growing and artificially propagated upon it."

What has been done with signal success at Fontainbleau in Gascony and many other provinces of France, as well as in other European countries and on Cape Cod, shows the practicability of reclaiming the worst deserts that can be found in our Atlantic States. Many other facts might be cited were it necessary, both from home and foreign fields, to prove the feasibility of this plan of reclaiming sterile lands. If one is to be commended who makes two blades of grass grow where but one grew before, how much more the farmer who makes forests thrive where *nothing* now grows.

The question is still often asked, will it pay the average farmer to plant trees? Certainly not, if early profit is essential. The answer depends on various circumstances, such as the size of one's farm, its soil and situation. But on an ordinary farm of from sixty to one hundred acres and upwards, I answer yes. If you are looking ahead and seeking an investment for future profit, "trees will make dollars, for they will grow in waste places where nothing else can be profitably cultivated. A soil too thin and rough for cereals may be favorable for trees. Hillsides and plains exhausted and worn out by the plow have often been reclaimed by planting forests. Ravines too steep for cultivation are the favorite seats of timber, and wherever a crevice is found in a rocky ledge, the root of a tree will burrow and spread, taking a hold so firm as to defy the storm, and acting mechanically disintegrate the rock and change its constituent elements into useful products. By the road-side, the river-bank, along the brook, and on the overhanging cliff, a tree may be always earning wealth for its owners. In no way can we ultimately enrich a State more than by planting the choicest trees on our exhausted and unproductive lands. In such situations, forests will yield a large percentage of profit. This is a duty we owe to ourselves and to our children.

George Peabody, who did so much to encourage schools and learning, originated the motto, so happily illustrated by his own munificent gifts to promote education: "Education—the debt of the present to future generations." We owe it to our children to leave our lands and towns the better for our tillage, and we wrong both ourselves and them if our fields are impoverished by our improvidence. But much as foresight is admired when its predictions are realized and its achievements made, all history too plainly tells that the mass of men are not easily persuaded to provide for exigencies far in the future.

Though the profit from tree-planting is remote, the pleasure is immediate. The sour and selfish soul may say, "Posterity has done nothing for me, and I will do nothing for posterity." But every effort to start agencies whose benign influence shall long endure, gives a glad inspiration and a conscious elevation of character.

15. The improvement of the surroundings of railway stations may well enlist the efforts of these associations. The railroad depots in America are often made repulsive by neglect or by the accumulation of discarded and decaying sleepers and other unsightly rubbish, while those in Switzerland, France, Germany and England are always neatly kept and usually adorned with shrubs, flowers, or their beautiful English or German ivy, sometimes covering the station-house with its dense garniture of foliage. The Pennsylvania Central Railroad, at the stations west of Philadelphia, is following this worthy European example. The beautiful little parks at Pomfret and Stonington depots in Connecticut, and those at Kingston, Rhode Island, and at North Conway and Plymouth, New Hampshire, show how simply and inexpensively our railroad stations may be made attractive. Parks and gardens are a proof and product of civilization, and are an index of the wealth and culture of any community. In the European countries above named, the Railway managers make it a part of the regular duty of the station-masters to adorn the surrounding grounds. There is a generous rivalry among these agents, who become justly proud

of their railway gardening and sometimes find their gain from the sale of bouquets to passengers. In striking contrast with these adornments is the slatternliness disfiguring our depots, as well described by D. G. Mitchell. "There are many charming suburban retreats near New York city, to which the occupant must wade his way through all manner of filthiness and disorderly debris, making his landing as it were in the very dung-heap of the place. Is there no remedy for this? Must we always confront the town with its worst side foremost? To make a township attractive, the approach to it must be attractive. Every village station wants its little outlying Green to give character and dignity to the new approach. In nine out of ten of way-side towns, such space could be easily secured, easily held in reserve, easily made attractive; and if there was no room for a broad expanse of sward, at least there might be planted some attractive copse of evergreens or shrubbery, to declare by graceful type the rural pride of the place. First impressions count for a great deal—whether in our meeting with a woman or with a village. Slipshoddiness is bad economy in towns as in people. Every season there is a whirl of citizens, tired of city heats and costs, traversing the country in half hope of being wooed to some summer home, where the trees and the order invite tranquillity and promise enjoyment. A captivating air about a village station will count for very much in the decision."

16. Among the minor aims of Rural Improvement Associations, are the providing of rustic seats under the shades for the comfort of pedestrians, pleasantly suggesting neighborly kindness and courtesy; setting up watering troughs for horses at convenient points where from adjacent hillsides never failing springs invite and facilitate this improvement; furnishing plans for rural architecture, and for gates and fences, or securing hedge-rows in room of fences, or, better still, in many villages combining to remove all fences and visibly dividing lines, so that the private grounds seem to unite with the way-side in one large lawn; the suggestion of the neutral tints for dwellings and outhouses in place of the glaring white hitherto so common; arrest of stray cattle, for strolling cattle usually are and always ought to be outlawed; preventing nuisances, one of these

is the tearing up the turf fronting a dwelling house by inconsiderate road-menders. There is ample room for the needful work of the scraper and the hoe without making unsightly cuts and gutters in front of residences. Painting advertisements on the rocks by the myriad nostrum makers is a nuisance that should be prohibited by law. The same may be said of the encroachments made upon the highway every time the stone-wall or fence boundary is rebuilt. The whole town should show an interest in preventing such curtailment of its roadways. A Rural Improvement Association can develop a public sentiment which will of itself correct these evils without occasioning any neighborhood strifes or alienations. In this matter the interest of one is the interest of all. The motto of the Swiss Confederacy, "One for all and all for one," is the true motto for the several districts and for all the people of a town. Hence the term *Rural* is preferable to that of *Village* Improvement, for not the village only but all parts of a town should be included in the plans and benefits of this movement.

17. An important work of rural improvement in many towns would be the betterment of the surroundings of their factories. Too frequently these grounds are disfigured with rubbish and made unsightly by neglect. Keep a man in a pig-sty and he would become swinish in his habits, but reverse the conditions and you reverse the results. The influence of flowers, shrubbery, or neat and cultivated grounds upon operatives in refining their taste and promoting their happiness and content is too often ignored. There is, however, a goodly number of our manufacturers who show their interest in their hands by making their factory buildings and tenement houses inviting, comfortable and healthful, and adorning the surrounding grounds. A description of the two model manufacturing villages of America and so far as I can judge, of the world, will show the desirableness and results of better provisions for the taste and comfort of operatives. I do not assume that all factories can fully adopt the standard of these establishments, which are in many particulars exceptional in their opportunities. There are serious embarrassments in large and crowded manufacturing towns, especially where the factories are controlled by non-resident owners, more anxious for dividends

than for the comfort and improvement of their workmen. The liberal policy of the Willimantic Linen Company, to give one of many similar examples, shows how these difficulties may be surmounted by wise provisions for the improvement and education of the hands.

One of these "models" is the silk factory of the Cheney Brothers in South Manchester, Conn., by far the largest and most successful factory of the kind in the world, making over 25,000 yards of ribbons and broad silks a day. This business started here by the Cheney family in 1836, has steadily grown in extent and prosperity to the present time. The factory village covers about eight hundred acres of land and includes some two hundred houses. A fine lawn laid out with winding concrete walks and adorned with shrubs and flowers fronts the mills, and usually each of the houses. No fence or visibly dividing line separates the front yards from the roads. The Cheneys have encouraged their hands to build and own their homesteads, and to this end furnish the land, and loan money for building at a low figure, with a "liquor reservation" in the interest of temperance and with the understanding that all houses shall be on a plan provided or approved by their architect and that all shall be neatly painted some neutral tint. Not a house in glaring white here offends the eye. The beautiful grounds of the Cheney mansions, of the operatives and of the factories all present the appearance of an extended park, and give a look of refinement, kindliness, and good neighborhood to the whole village which is like a well-kept garden. No private yard is left in an untidy state. No debris or rubbish is seen around or near any dwelling. There is evidently a public sentiment in favor of neatness and order that pervades the entire community and allows no dirty nooks to be found. Creeping vines cover "the office" and some of the factory buildings and dwellings. No block houses are found here. The cottages stand apart and vary in style, giving an individuality to each place. A capacious aqueduct carries water to every house. This village seems like a community in the best sense of the term, with common interests, pursuits, and sympathies. The providing of a large and commodious lecture hall costing $50,000, together with interesting and instructive lectures and entertainments and a free library and reading room, solely by the Cheney Brothers, shows their intelligent and liberal methods of promoting the well-being and content of their employés. The hands highly appreciate the liberality of their employers and feel a manifest interest in their work and a pride in the place. Hence strikes and alienation between capital and labor are here unknown.

The other model manufacturing village is that of the Fairbanks Company at St. Johnsbury, Vermont. There is the largest manufactory of scales in the world, employing in the factory and branch departments elsewhere, over one thousand men, and manufacturing over 60,000 scales annually, the sales now amounting to over $2,000,000 a year. It has long been a marvel how such a concern could be made a permanent success for full fifty years in the northeast corner of Vermont, so far from tide-water, with expensive freightage, the items of coal and iron alone being yearly about 10,000 tons, with many other heavy supplies from the sea-board and the necessity of transporting thither, the manufactured products. Throughout New England of late the tendency of manufacturers has been from the interior to the seaside. They have often abandoned old sites and water privileges far inland and built near the great markets, where they must run by steam only. But in St. Johnsbury, notwithstanding these disadvantages, the business has steadily grown and become a success, which, in view of the difficulties overcome, is unparalleled in this country.

What is the explanation of this marvelous prosperity? On revisiting St. Johnsbury recently, the first impressions made seven years ago were confirmed. I inspected the works, talked freely with the hands as well as the owners and with the citizens of St. Johnsbury not connected with the factory. To observe the home-life of the operatives, I entered their houses and conversed with their families. These inquiries brought out facts and inferences suggestive alike to all employers and employed.

This village, where nature has been lavish of her gifts, shows the added charms of landscape art. The whole town is justly proud of their beautiful soldiers' monument, their fine public building, and manifold rural adornments. This company maintains the highest reputation for integrity. Many names honored abroad are tarnished at home. Only the strictest honesty and fair dealing can stand the test of daily business intercourse with hundreds of hands for half a century. "They do everything on the square," was, in substanee, the answer of many citizens and workmen to my inquiries on this point. The company has fairly earned and gained the confidence of their men and of this entire community, and a good name at home naturally follows them everywhere. The workmen say that they are never permitted to do any sham-work, even for the most distant market. To quote the pithy phrases of the men, "no shoddy here," "no veneering," "no puttying."

There is a superior class of workmen in this establishment. All are males. Their work is proof of skill. Their looks and conversation indicate intelligence. They are mostly Americans, and come from the surrounding towns. More than half of them are married, and settled here as permanent residents, interested in the schools and in all that relates to the prosperity of the place. Many of them own their houses, with spacious grounds for yard and garden, and often a barn for the poultry and cow. These houses are pleasing in their exterior, neatly furnished, and many of them supplied with pianos and tapestry or Brussels carpets. How different from the nomadic factory population, swarming from Canada and from other lands to densely crowded tenement houses, who never bind themselves to civilization by a home, much less by a house of their own! The tenement houses, also, are inviting and comfortable, and surrounded with unusually large grounds. The town is managed on temperance principles, and drunkenness, disorder and strife among the hands are almost unknown. Most of them are church-goers, many of them church members.

I examined the pay-roll and found the wages very liberal. The workmen seem well satisfied on that score. Wherever it is possible, the work is paid for by the piece. The work itself is largely done by machinery and that *sui generis*, invented here and for the special and peculiar results here reached. The men are encouraged to expedite their processes by new inventions and share largely in the benefits of all such improvements. I conversed with one of the hands who invented a curious apparatus by which he marks a hundred register-bars with greater accuracy and in but little more time than he could formerly do one. He now finds working by the job especially profitable. Paying by the piece has worked well here. The men say it is fairer to pay for results than by hours. The worth of labor depends upon its products. This plan stimulates industry, promotes skill, and fosters inventiveness. It apportions rewards to the quantity and quality of work done. But more than all, this plan is recognized by the men as just and satisfactory. With the time left practically to their own choice, there is no eight-hour movement here. No "Labor League" or Union has ever existed—no strike ever been suggested. This would be a poor place for the Internationals to preach the gospel of idleness or agrarianism. Imagine one of these delegates just arrived at St. Johnsbury and beginning his arguments for a strike with Mr. ——, whose house I visited. I fancy him replying somewhat as he did to my inquiry. "Why is it you never have any strikes here?" "Well, we have a good set of men to start with—temperate and moral. Then we are well paid. Wages have often been advanced. The owners take an interest in the men. They are liberal and public spirited, and are doing a great deal for the place, and we feel an interest in the success of the concern which has been the making of St. Johnsbury."

There has evidently been mutual sympathy and interest between employer and employed. The senior Governor Fairbanks used to say to the men, "You should always come to me as to a father." He maintained relations of kindness with them, visiting the sick, helping the needy, counseling the erring, encouraging their thrift, enjoining habits of economy. He taught them that it was their interest and duty to "lay up something every month," and that the best way to rise in the social scale was to unite economy with increasing wages. He himself both preached and practiced economy. He was a conspicuous example at once of strict economy and princely liberality. His benefactions were munificent, both at home and abroad. The fact that so many of the workmen are "fore-handed," besides owning their homesteads, is due to his teaching and example. The worth and dignity of work he illustrated in theory and practice. The notion that labor was menial, or that the tools of trade or farm were badges of servility, he despised. His sons worked in the shop, and thoroughly learned the trade. The brothers of the Governor were in full sympathy with him, and the same spirit characterizes the sons and the surviving brother who now manage the concern. There is still the fullest and happiest conciliation between labor and capital. It is not strange that the workmen "hold on." Their permanency is a striking fact. Many have been here from twenty to over forty years.

Years ago the men were aided in forming and sustaining a Lyceum, and liberal prizes were offered for the best essays read. Recently, Horace Fairbanks has founded a library, and opened a large reading-room free to all. The Athenæum containing the library, reading-room, and also a spacious lecture-hall, is an elegant structure, ninety-five by forty feet, two stories high. The books, now numbering nearly ten thousand volumes, are choice and costly; two hundred and thirty volumes have been drawn in a single day. In the reading-room, besides a good supply of American periodicals, daily, weekly and quarterly, I noticed on the tables many European journals, including four English quarterlies, six London weeklies, and ten monthlies. The library and reading-room are open every week-day and evening, except Wednesday evening, when all are invited to attend the weekly "lecture," which is held at the same hour in all the churches. Having visited nearly every town of Massachusetts and Connecticut, and traveled widely in this country, I have nowhere found in a village of this size an art gallery so costly and so well supplied with painting and statuary, a reading-room so inviting, and a library so choice and excellent as this.

Thaddeus Fairbanks, one of the three founders of the scale factory, has liberally endowed a large and flourishing academy, which promises to become the "Williston Seminary" for northeastern Vermont.

These various provisions for the improvement, happiness, and prosperity of this people, coupled with liberality and fairness in daily business intercourse, explain the absence of discontent and the uniform sympathy, good feeling and harmony which prevail.

How to harmonize labor and capital is now one of the great questions of the age. Their alienation has recently caused idleness, distress and crime on one side, and lock-outs, derangement of business and enormous losses on the other. The many millions lately lost by mistakes on this question furnish only a new version of the old story of antagonisms between those who should be partners. I have nowhere seen a better practical solution of the Labor Question than in South Manchester and St. Johnsbury.

18. As plans for Rural Improvement Associations are often called for, the following, adopted in Clinton, Conn., is given.

This association, though organized less than two years since, has already accomplished important results. A circular addressed to the citizens of that town by this association, says:

" At our last town meeting, a liberal sum was unanimously appropriated for improving our road-sides. The coöperation of every citizen is needed to carry on this good work. While no sudden changes are expected, and while the full results desired will require time, still, with the united efforts of our people, Clinton can soon be made the most beautiful town on the Shore Line, offering with the rare privileges opened in the Morgan School, unequaled advantages and attractions to invite wealthy and desirable residents who are seeking a country home."

BY-LAWS AND REGULATIONS OF THE CLINTON RURAL IMPROVEMENT ASSOCIATION.

1. This Association shall be called "The Rural Improvement Association of Clinton."

2. The object of this Association shall be to cultivate public spirit, quicken the social and intellectual life of the people, promote good fellowship, and secure public health by better hygienic conditions in our homes and surroundings, improve our streets, roads, public grounds, side-walks, establish good grass borders in the streets and public squares, provide drinking troughs, break out paths through the snow, light the

streets, remove nuisances, and in general to build up and beautify the whole town, and thus enhance the value of its real estate and render Clinton a still more inviting place of residence.

3. The officers of this Association shall consist of a President, a Vice-President, a Treasurer, a Secretary, and an Executive Committee of fifteen, six of whom shall be ladies.

4. It shall be the duty of the Executive Committee to make all contracts, employ all laborers, expend all moneys, and superintend all improvements made by the Association. They shall hold meetings monthly from April to October in each year, and as much oftener as they may deem expedient.

5. Every person who shall plant three trees by the road-side, under the direction of the Executive Committee, or pay three dollars in one year or one dollar annually, and obligate himself or herself to pay the same annually for three years, shall be a member of this Association.

6. The payment of ten dollars annually for three years, or of twenty-five dollars in one sum, shall constitute one a life member of this Association.

7. Five members of the Executive Committee present at any meeting shall constitute a quorum.

8. No debt shall be contracted by the Executive Committee beyond the amount of available means within their control, and no member of the Association shall be liable for any debt of the Association, beyond the amount of his or her subscription.

9. The Executive Committee shall call an annual meeting, giving due notice of the same, for the election of officers of this Association, and at said meeting shall make a detailed report of all moneys received and expended during the year, the number of trees planted under their direction, and the number planted by individuals, length of sidewalks made or repaired, and the doings of the Committee in general.

10. This constitution may be amended at any annual meeting by a two-thirds vote of the members present and voting.

RURAL IMPROVEMENT.

"How can we start a Rural Improvement Association in our town where there is little or no interest in the subject?" is a question often asked of late. In answering this inquiry I present some suggestions growing out of a varied experience in organizing over fifty associations in Connecticut and as many more in the other New England and the Middle States. The indifference complained of, is to be expected where attention has not been called to the importance and results of such improvements, while interest and often enthusiasm naturally follow the proper presentation of this subject.

When this work was begun in Connecticut a dozen years ago it encountered, as I then predicted, some misapprehension and ridicule, but that ceased sooner than I expected and it now commands the sympathy and coöperation of the wisest and best men of our State. While I feel a grateful pride in the fact that something in the line of rural adornment has lately been accomplished in all our towns, especially around the homes and grounds of our citizens, this effort should not be slackened till an efficient association is formed in every township. I shall be happy to coöperate with public-spirited citizens who are moving in this matter, and will lecture on this subject without charge either for services or expenses in any town in Connecticut. Though this is no part of my prescribed duties, but simply a volunteer avocation in addition to my proper vocation, my interest in the work grows with years and results. It is my ambition to do my utmost to IMPROVE THE HOMES AND HOME LIFE of our people and help them to realize that the highest privilege and central duty of life is the creation of happy homes. The multiplied ministries of nature, providence, and religion center in the maintenance of happy homes. The higher aim of the industries of life, whether agricultural, manufacturing, or commercial, and the great end for which Government itself is worthy to be sustained is that men may live in happy homes. "The hope of America is the homes of America." You improve the schools by improving the homes as truly as you improve the homes by improving the schools.

In forming a Rural Improvement Association the main tug is at the start on account of the inertia of ignorance and indifference. It is the first step that costs—at least it costs effort and information to set this thing on foot, but that step once taken and others are sure to follow.—Experience shows that the best way to begin this work is to call together the people for a free lecture, setting forth the importance, aims and results of this movement, and then strike while the iron is hot by adopting a constitution and appointing the proper officers. To give a single example, after such a lecture in Warwick Neck, Rhode Island, recently, an association was formed, "a constitution" which I furnished was adopted, the proper officers appointed and over $300 raised by membership fees, and all this was done in about half an hour after the close of my lecture. Before I left town the next morning, some of the improvements recommended were begun. The next week $2,000 were raised. This is certainly a good beginning for an association not yet two weeks old.

The fact of "want of interest" in any town should suggest the need and methods of creating interest. A proper presentation of the subject will show that no community can afford to continue without some organized efforts, such as have elsewhere done great good in cultivating public spirit and town pride, quickening intellectual and social life, securing better hygienic conditions, improving roads, road-sides, sidewalks, public grounds, the surroundings of railway stations and factories, and best and most of all, the homes of the people, and in general so beautifying and building up our towns as to enhance the value of real estate. The citizens of New Milford, Litchfield, Clinton,* and many other towns of Connecticut, have already learned that money wisely expended for public improvement, proves a good investment. Such improvements pay in many ways. They help to retain in a town its wealthy and public spirited citizens, and attract desirable residents from abroad, whom a narrow and unprogressive policy would repel. Our experience proves that public improvements and growth stand related as cause and effect. The proximity of Connecticut to the commercial metropolis of our country, opens grand opportunities of thrift and prosperity to her public spirited towns. Since the achievement of rapid transit by the elevated railroads, Connecticut can invite or repel desirable residents in greatly increasing numbers. A liberal spirit will invite wealth and population in still larger measure to our borders. The many new comers from New York city to our progressive towns are the friends of rural adornments, knowing well that these are investments which enrich any community. On the other hand, a penurious policy is penny-wise and pound-foolish. It defeats its own aim of saving and results in deterioration and loss. Men of culture and influence shun a narrow-minded and illiberal community. A good name tends to enrich a town as well as an individual, while a bad one may impoverish both.

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* Clinton has just appropriated $1,000 for concrete walks to be made where the abutters pay one-half the expense. This will secure the expenditure of $2,000 for this purpose.

The remotest districts of some towns show great interest in this work. Hence the term *Rural* is preferable to *Village* Improvement, for all parts of a township should be included in the plans and benefits of such an association. At Warwick Neck, Rhode Island and West Ewing, New Jersey, where so much is now doing in this line, there is no village, but only scattered homes and farms.

The educational bearings of this subject, though less obvious are not less important. As this movement met opposition at the outset and often encountered the question: "What has that to do with education," I may be pardoned for giving two or three brief extracts from extended articles in papers outside of our State. The notices in the Connecticut journals have been too complimentary to be quoted here. A Boston paper in urging that rural improvement should be made as general in other States as it is in Connecticut, says: "Mr. Northrop began years ago the development of a plan to make the State of his nativity, and of his more recent labors worthy of her grand natural opportunities. He has blended the idea of rural improvement very intimately with educational ideas, and *it seems justly to belong in that company.* There is so much dependent upon rural development, that he who convinces the public of its importance, is laying single-handed, the foundation of greatly increased culture, health and profit in every rural community. Beauty is its own excuse for being and needs no reinforcement of its claims before a jury where the æsthetic principle is allowed due influence."—*Boston Post.*

"Mr. Northrop's plan, the result of years of observation and experience, is simple and practical in any community. It contemplates the indirect as well as the direct improvement of personal and social life in the country, and includes all that can make country places attractive, and facilitate refining social intercourse among the people who inhabit them. The great difficulty is in the beginning. The need is that there shall be organized in every village and country town, a rural improvement association. The man or woman who shall take hold of this matter and create the needed organization in any community will be a public benefactor, worthy of reverence and deep gratitude.

"The educational effect of such employments and interests, the refining influence, the æsthetic improvement wrought, the enlargement of heart and mind which grow directly and indirectly out of work of this kind, done by united effort by the boys and girls of a town, under the stimulus of public approval, are not to be set down in words or expressed in figures. In any town in which juvenile enthusiasm is awakened in public improvements. the schools will accomplish better results; the library will be more freely and more profitably used, there will be less idleness, less wrong-doing; habits will be better, aspirations higher, the tone of life stronger. Every such town must improve in intelligence, taste, public spirit and morality, quite as positively as it grows in external beauty and attractiveness."—*N. Y. Evening Post.*

Money judiciously expended in rural improvement would do an amount of good not easily computed. Such an expenditure would in time come back by thousands and millions. Those towns which begin the earliest and work with the most zeal, liberality and taste in all these matters, will be the most populous and prosperous. With our rapidly returning prosperity, we are soon to see a new movement in all directions to adorn and beautify our country towns and villages. The appetite for the beautiful—without as well as within doors—and the demand for plants, flowers, flowering shrubs and ornamental trees is increasing enormously from year to year."—*N. Y. Independent.*

The *N. Y. Observer*, *Scribner's Monthly* and many other periodicals endorse this "Connecticut Movement" in the strongest terms.

B. G. NORTHROP.

CAPITOL, HARTFORD, October 13, 1880.

The Republican.

Entered at the Post-Office at Springfield, Mass., as Second-Class Matter.

SPRINGFIELD, WEDNESDAY, FEB. 16.

THE PROPOSED BOSTON PARK.

Tract Five Times as Large as Central Park.

retary B. G. Northrop in the New York Independent.]

he Fells lie wholly in Middlesex county, and he center of this mountainous tract is with- miles of the Boston post-office. It lies in tate of betweenity," on the borders of the e towns of Stoneham, Medford, Winchester, Melrose and Malden. This is historic ground. Two hundred and fifty years ago Gov John Winthrop described these rugged hights, over which he made a toilsome journey and from hich he surveyed with admiration the pri- al forests, the adjacent ponds, and all this l and varied landscape, and further on the autiful bay and distant ocean. This "forest eserve," or "five-mile wood," has been greatly dmired from that day to this. Prominent citi- ens of Cambridge and other surrounding towns ave long shown a deep interest in the preservation of this forest. Some five years ago a petition to convert this tract into a public park, signed by such men as ex-Gov Washburn, H. W. Longfellow, and James Russell Lowell, was presented to the Legislature. John Owen of Cambridge has labored zealously for the same end, as has Elizur Wright, now the president of the Fells association. The earliest advocate of the public ownership and protection of such a "forest preserve" was Wilson Flagg, the author of the "Woods and By-ways of New England," who published an elaborate article on this subject in 1856. He would guard this "White mountains in miniature," with all its native grandeur, from the æsthetic vandalism that would substitute for its primitive wildness the artificial attractions of a city garden. Though its proper name is, and is to be The Fells, I have called it above a Boston park, because, if this magnificent plan is carried out, it must be done largely by Boston capital and liberality. I fully agree with Mr Flagg that it should not be subjected to the elaborate ornamentations of ordinary parks, but be kept like that adjoining the old castle in Heidelberg in all its native beauty and picturesqueness. It is remarkable that this large tract of 4000 acres (about five times the size of Central park in New York, comprising so great a variety of surface and scenery, with rugged ridges, valleys and lakes, and nearly all the best conditions for a magnificent natural park, much of it well-wooded with a good variety of our best forest trees) can be found so near the metropolis of New England, and still nearer the homes of the 20,000 people who live in the abutting towns above named.

With a proper addition, it might become a complete arboretum of all the American trees which thrive in our climate. That would make it still more a favorite resort with the thousands who in coming years would thread the winding foot-ways or ride over the rustic bridle-paths, or drive through the carriage roads that would be open to the public. Its educational influence, in fostering a love of nature, and especially the study of trees of every kind, would be of great value. The large ponds in the Fells furnish charming water views, in comparison with which the little lakes in Central park, beautiful as they certainly are, seem tame. Charles Sumner said that in all his foreign travels he had seen but one lake of the size of Spot pond comparable with it in beauty. One of the speakers said: "Were this park located among the other wonders and marvels of Switzerland, Americans would visit it and become enthusiastic in its praise."

Aside from its æsthetic attractions, it is intended to reforest the denuded portions of these hills. The influence of forests on climate and water-supply was discussed, and it was shown that extensive forest denudation everywhere diminishes the flow of springs. Dr Piper, who lived near one of these ponds, in his "Trees of America," referring to the fact that it owed its existence to a stream which has its source in the Fells, says: "Within 30 years these hills, which were clothed with a dense forest, have been stripped of trees, and, what was never heard of [illegible] entirely dry. [illegible] the last 10 years a new growth of wood has sprung up on the land formerly occupied by the old forest, and now the water runs through the year." A multitude of similar facts might be given. The forests serve as store-houses of moisture, both from their leafy canopy, which shuts out the sun, and the millions of leaves covering the soil and acting like a sponge, soaking up and retaining the rain and regulating its distribution, while the roots act like vertical drains, loosening the soil, favoring infiltration, and promoting the descent of the water into the lower strata of the earth, there to nourish the springs; while in lands devoid of trees the rain sinks less into the soil, but more speedily reaches the brooks and rivers and runs to waste, if not resulting in disastrous floods.

As the water supply of 20,000 people depends mainly on the Fells, and as the urgency is great, I suggested at the Medford meeting as the obvious remedy, extensive tree-planting, chiefly of our noble native trees, of which we have the best and greatest variety in the world; but advocated covering the summits and rugged hill-sides with the European larch, and for the following reasons: Its cheapness (the two-years-old trees can be procured for $8 per thousand); its hardy character (it will thrive where little else will grow and may be easily as well as economically transplanted); the remarkable rapidity of its growth; the beauty of the tree, its symmetry of form, and the durability of the timber. It is the great economic tree of Europe, and its adaptability to rugged hill-sides and rocky ground has been abundantly tested, both in Scotland and America. In Scotland vast areas of barren hills, worth not over a shilling an acre, have been densely covered with this tree, and thus made very beautiful and valuable. Col Higginson, differing from me on this point, strongly urged that no foreign tree whatever should be planted in the Fells; but that it should be only an indigenous garden and nursury of the wild flora and fauna of New England. Though I had previously spoken of the great variety and beauty of our native trees, and urged their propagation to the utmost through the Fells, it eemed to me desirable to plant on the most arren ridges that hardy tree, which will thrive vhere nothing else will grow.

The Need of the Country Towns.

[New York Evening Post.]

When we reflect how easy it is to make a rural place or a country village attractive in appearance, how little labor is necessary to that end where there is ground enough, as there is in every village and country place; when we reflect that nature herself is constantly trying to do the work and needs scarcely more than man's permission, it seems a wonder that there are other than beautiful country places and attractive villages anywhere. Nevertheless dreary, treeless, dusty, desolate, disordered and disreputably-appearing villages and country places out at elbows are in many parts of the country the rule, not the exception. As one looks at such villages out of a car window, and contemplates their dreary slatternliness, the thought of passing a lifetime in them brings a shudder with it. Without doubt, too, the desire to escape such a life has much to do with the speedy running away of all the young men in such villages who have aught of aspiration or strength. Without quite understanding their own motives perhaps such young men embrace the first opportunity of quitting the place of their birth, where life is inexpressibly dreary; and the villages and country districts thus stripped of the flower of their youth sink steadily lower and grow constantly more and more slatteroly.

For these things there is no excuse. Wherever they exist they bear testimony that cannot be contradicted to the indolence, unthrift, or æsthetic grossness of the people. An untidy house is not a worse reproach to its mistress than an untidy village or rural neighborhood is to its people. The planting of trees and shrubs and vines, the care of grass, the maintenance of good footways, the proper care of waste materials so that they shall not litter the streets or station grounds, the setting up of lamp-posts, the care of garden fences, these and like things cost very little either in time or in money, and there can be no doubt that attention to such matters in the end makes a full return even in money, to say nothing of the good that intelligent rural folk get from such things by the amelioration of their own lives.

Mr. B. G. Northrop, whose apostleship of rural improvement has been a beneficent influence in Connecticut for years, has recently published a pamphlet on the subject, entitled "Rural Improvements," which we heartily wish every dweller in village or country might read attentively. We do not intend now to review the pamphlet, or to do more than direct attention to it and to its subject, but it is worth while to say that Mr. Northrop's plan, the result of years of observation and practical experience, is simple and practicable in any community, and that it contemplates the indirect as well as the direct improvement of personal and social life in the country. Briefly expressed, his purpose is to induce the people of every village and town to make their several homes and their towns also attractive to the eye and mind, healthful, convenient and beautiful. He would have trees planted along the road ways and upon worn and barren spots; he would have good sidewalks, proper street lamps, well kept greens, tidy station houses; he pleads for libraries and other means of self-culture for young and old; for attractive surroundings to schoolhouses and churches, and for all else that can in any way tend to make country places attractive and to facilitate refining social intercourse among the people who inhabit them.

The desirableness of all these improvements is apparent in a general way, on the surface, but Mr. Northrop succeeds in pointing out many benefits likely to arise from rural improvements, which do not suggest themselves at first. One great advantage gained is due to a difficulty. Because comparatively little can be accomplished without organized and united effort, success, wherever it is achieved, brings a double benefit. The organization of the people for a local public purpose is in itself scarcely less a benefit than the material results of the work done. Such union for a common purpose promotes social intercourse, heals the feuds which distract most rural communities and breeds public spirit, local pride and local attachments, and all these things are agencies of the greatest good in every village or rural town where they exist. Moreover if the people of a town unite in an effort to improve its streets and commons and footways and to make it a pleasant place to live in, the additional duty of improving individual surroundings may safely be left to stimulated personal pride and improved personal taste.

Another indirect but valuable result grows naturally out of the exigencies of the work. Every association for rural improvement must enlist the youth, the boys and girls of the place in the work. They, more readily than anybody else, become interested in such matters, and they may easily be induced to bring trees from the forest and to plant them where they are needed, without cost to anybody and without other than willing and eager work. How great the good is that boys and girls derive from their own active interest in such things, every attentive observer of youth, every enlightened parent and teacher knows. The educational effect of such employments and interests, the refining influence, the æsthetic improvement wrought, the enlargement of heart and mind which grow directly and indirectly out of work of this kind, done by united effort by the boys and girls of a town, under the stimulus of public approval, tropolis of New England, and still nearer the homes of the 20,000 people who live in the abutting towns above named.

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Every city, town and village should have its own special attractions in the way of parks, sidewalks, shade-trees, fountains, flowers, etc., and all the people should be earnestly and cordially invited to participate personally in helping forward such improvements. Those who propose to act in this matter should secure Mr Northrop, or some other able man, to address the people and stir up a general interest on the subject, and also help in the organization of a local society. We ask our readers in all directions to take hold of this matter now, so that a beginning may be made the coming summer.—[New York Independent.

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rural improvement has been a beneficent influence in Connecticut for years, has recently published a pamphlet on the subject, entitled "Rural Improvements," which we heartily wish every dweller in village or country might read attentively. We do not intend now to review the pamphlet, or to do more than direct attention to it and to its subject, but it is worth while to say that Mr. Northrop's plan, the result of years of observation and practical experience, is simple and practicable in any community, and that it contemplates the indirect as well as the direct improvement of personal and social life in the country. Briefly expressed, his purpose is to induce the people of every village and town to make their several homes and their towns also attractive to the eye and mind, healthful, convenient and beautiful. He would have trees planted along the road waye and upon worn and barren spots; he would have good sidewalks, proper street lamps, well kept greens, tidy station houses; he pleads for libraries and other means of self-culture for young and old; for attractive surroundings to schoolhouses and churches, and for all else that can in any way tend to make country places attractive and to facilitate refining social intercourse among the people who inhabit them.

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There is no reason why any village or any rural town in this country should be desolate or unsightly; no reason why life in any village or country town should lack pleasure or society should be deficient in refinement or culture. In great cities large sums of money must be spent for small patches of ornamental grounds called parks; in the country every villlage, every street road and lane, every dooryard may be made part of a great park, and that, too, at scarcely appreciable cost which is returned at once in enhanced property values, to say nothing of the larger returns made in other and higher ways.

Unluckily, men move in matters of this kind only in answer to the impulse of a leader, and local leaders are not always to be found, while there are very few men capable of working as Mr. Northrop has done for ten years in a systematic effort to arouse the enthusiasm of his state for rural improvement. His pamphlet, if it shall be widely circulated, will do much to awaken attention, and wherever there are active men disposed to become local leaders in the cause it will serve also to direct the efforts made into right channels. The great difficulty here, as elsewhere, is in the beginning. The need is that there shall be organized in every village and country town and rural neighborhood a rural improvement association, and that active efforts shall be made to draw into it as nearly as possible everybody who lives in the place. Such an organization will always find ways enough in which to work improvement, and the spirit of friendly rivalry between the associations of neighboring towns, each striving to improve upon the others' methods, must very soon create something like an art of rural improvement which shall bring to light the best ways of accomplishing the desired results.

There ought to be in every rural place some man or woman—for the work is eminently fit to enlist the sympathy and taste of womankind—who will take hold of this matter and create the needed organization. The man or woman who shall do this in any community will be a public benefactor, worthy of reverence and deep gratitude.

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